# MARKET VALUATION OF THE TRANSLATION PROCESS UNDER SFAS NO. 52: FURTHER EVIDENCE

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This research investigates the information content of the translation information resulting from exchange rate fluctuations. Two hypotheses are examined. The dollar movement hypotheses investigate whether there is a positive relationship between security valuation and the translation information and whether the market assigns different weights to translation gains and losses in both the depreciating and appreciating exchange rate environments. The geographic concentration hypothesis tests whether the market's response to the translation information is geographically sensitive.

Prior research on SFAS No. 8 and SFAS No. 52 has concentrated on the price and trading volume responses to the deliberations and issuance of these two accounting statements. Soo and Soo (1994) examine the long-term effect of the disclosure requirement under SFAS No. 52 on MNEs' security prices from 1981 to 1987. However, they fail to address two important issues pertinent to the MNE research--the effects of exchange rate changes and the geographic concentration.

The dollar movement hypotheses provide strong evidence that under both the appreciating and depreciating exchange rate environments, a positive relationship exists between security returns and the translation information when MNEs disclose translation losses in stockholders' equity. The findings also provide evidence for a positive or at least non-negative relationship between security returns and the translation information

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

# CHAPTER 1

## INTRODUCTION

This study examines whether the market values foreign exchange translation gains and losses resulting from exchange rate fluctuations in determining the security prices of U.S. multinational enterprises (MNEs) around the earnings announcement date. Two issues are examined in this study. First, this research addresses and investigates the impact of periods of parallel exchange rate changes among key non-U.S. currencies on the economic valuation of MNEs. During the 1980s and 1990s, exchange rate movements have been either appreciating or depreciating for a prolonged period of time before changing direction again (see appendix A). Failure to distinguish between periods of appreciation and depreciation may result in the averaging of positive and negative market reactions to reported translation gains and losses. This study specifically addresses the question of whether the market reacts to the translation information and whether the market assigns different weights to the translation information in both the depreciating and appreciating dollar movement environments when either translation gains or translation losses are disclosed by MNEs.

Second, this research investigates whether the geographic regions of MNEs' primary foreign operations also impact the market's reaction to the information on translation gains and losses. The geographic regions of MNEs' foreign operations have an impact on the sign and magnitude of the disclosed translation information resulting from exchange rate fluctuations as the currency of a specific country is chosen as the

functional currency to translate a subsidiary's financial statements. The examination of the impact of the geographic regions controls for the potential offsetting effects from the values of the non-U.S. currencies relative to the dollar on the translation information. To address this issue, I partition the sample firms based on MNEs' primary foreign operations and examine the joint effects of geographic regions and the translation information on MNEs' security returns in different exchange rate environments. One of the partitions of interest in this study is the Asia/Pacific Rim area. This area was selected mainly because of the increased expansion of U.S. MNEs' economic interests in this area and also because of the volatile economic environment of this area in recent years.

Prior research has concentrated mainly on the price and trading volume responses to the deliberations and issuance of *Statements of Financial Accounting Standards Number 8* (SFAS No. 8), *Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements,* and *Number 52* (SFAS No. 52), *Foreign Currency Translation*.[1] Few studies, with the exception of Soo and Soo (1994), have examined the long-term effect of the disclosure requirement under SFAS No. 52 on MNEs' security returns. Soo and Soo (1994) examine the usefulness of foreign exchange gains and losses in determining MNEs' security prices. Even though they look into the effect of SFAS No. 52 on security prices from 1981 to 1987, they ignore the long-term impact of exchange rate changes on cumulative translation gains and

[1] The Statement No. 8 versus Statement No. 52 section of this chapter provides a summary of SFAS No. 8 and No. 52 disclosure requirements.

losses reported in stockholders' equity. They also fail to control for the issue of geographic areas of MNEs' primary foreign operations.

The examination of whether the market reacts to foreign exchange translation information is worthwhile and important for two reasons. First, the information on foreign exchange gains and losses is a specific source of publicly disclosed information regarding MNEs' exposure to exchange risk. This research provides useful evidence on whether the market uses this information to assess the exposure of MNEs' foreign operations to exchange rate changes, as reflected in MNEs' stock prices.

Second, this research also settles claims raised by researchers in earlier years of the implementation of SFAS No. 52. Beaver and Wolfson (1984) claim that, so long as translation information captures some of the economic forces behind the relation between interest rates and exchange rates, foreign exchange translation information is an important performance indicator of foreign operations of MNEs and should be included in the determination of income. Without this information, the usefulness of earnings information suffers. Some other studies also address the potential negative effects of reporting foreign exchange translation gains and losses on the balance sheet, bypassing the income statement (see, e.g., Benjamin et al. 1983; Tompkins 1986; Schweikart and Sanborn 1991).

Hence, the first objective of the current study is to specifically examine the impact of the translation information on security prices of MNEs in both the appreciating and depreciating exchange rate environments. The second objective is to investigate whether the market assigns different weights to the translation information when an MNE reports

translation gains versus translation losses in each exchange rate condition. The third objective of this study is to examine whether the geographic areas of MNEs' primary foreign operations also affect the market's response to the translation information.

This study uses two models to address the research questions. The first model examines the effect of exchange rate movements on the association of security returns and the information on translation gains and losses reported in stockholders' equity, whether MNEs report translation losses or gains. The second model incorporates the effect of the geographic concentration of MNEs' foreign operations and examines the information content of the translation information in both the depreciating and appreciating exchange rate environments.

The findings under the first model provide strong evidence that, when MNEs disclose translation losses in stockholders' equity, the market uses the translation information when valuing MNEs security prices in both the appreciating and depreciating exchange rate environments. However, the findings do not provide support that the market uses the translation information in both the depreciating and appreciating exchange rate environments when MNEs disclose translation gains in stockholders' equity. This is consistent with Rodriguez's (1980) findings that expected exchange losses carry a stronger weight in hedging decisions than expected exchange gains.

The second model controls for the effect of the geographic concentration of MNEs foreign operations and examines the information content of the translation information in both the appreciating and depreciating exchange rate environments. The evidence from the Asian Pacific, European, and South/North American partitions

provides limited evidence as to the usefulness of the geographic disclosures in the association test of security valuation and the translation information. It is possible that the more aggregated level of the geographic disclosures at the continental level prevents the ability of the market to sort out the effect of the geographic information on security valuations.

## Motivation

Translation gains and losses are paper gains and losses resulting from exchange rate movements with no cash flow consequences on MNEs. Therefore, translation gains and losses are posted to stockholders' equity instead of the income statement under SFAS No. 52.[2] However, several studies have documented the impact of foreign exchange rate changes on MNEs. Beaver and Wolfson (1984) argue that changes in foreign exchange rates reflect changes in a country's interest and inflation rates that have a direct impact on the value of foreign assets and the risk of foreign investment. Tompkins (1986) demonstrates that translation adjustments resulting from foreign exchange rate changes influence the value of equity, return on equity, stock price, and capital structure of MNEs. The consequence of exchange rate changes on translation adjustments influences an MNE's planning function, and the economic income of shareholders. Moreover, Benjamin et al. (1983) find that the use of SFAS 52 causes stockholders' equity of their sample firms to decrease by an average of 1.93 percent. Schweikart and Sanborn (1991)

[2] In June 1997, the FASB issued SFAS No. 130 – *Reporting Comprehensive Income* (FASB, 1997a). Translation gains and losses are now included as a component of the other comprehensive income.

also argue that unrecognized translation losses cause erosion of MNEs' equity positions during an extended period of an appreciating dollar. Hence, the importance and the impact of foreign currency fluctuations cannot be ignored in the study of MNEs.

In general, studies on SFAS No. 52 have mainly focused on the early years of SFAS No. 52 implementation. More recently, Soo and Soo (1994) examine whether the stock market considers foreign exchange translation gains and losses over time (from 1981 to 1987) when pricing equity securities. However, they ignore the long-term impact of exchange rate fluctuations on the Cumulative Translation Adjustment (CTA) account in shareholders' equity and on security returns. Moreover, Soo and Soo do not find consistent results from the two models they estimate to examine the usefulness of the translation information in security valuation. They adopt both the random walk and the white noise models to examine the information content of the translation information. Only the white noise model provides significant results on the information content of the translation information. The white noise model treats the gross change between this year's and last year's CTA account (this year's gross translation gains and losses), disclosed in stockholder's equity as the unexpected translation information. The empirical evidence supports that the market reacts to the gross change in the CTA account. However, they do not find any significant results on the translation information when the random walk model, which utilizes the difference between this year's and last year's change in the CTA account, is estimated. An estimation of their model with this study's data finds that the difference between this year's and last year's change in the

CTA account is significant in explaining security returns.[3] The difference in results may be attributed to different sample firms and years examined in this study and also to the mis-specification of their model.

The failure to include the long-term effect of exchange rate changes may explain their weak findings for the translation information. Soo and Soo's (1994) sample period aggregates both periods of a strengthening dollar and a weakening dollar. The period between 1981 and 1987 was, in general, evidenced by the rising value of the dollar from 1981 to 1985 and a decline in its value from 1985 to 1987 (see appendix A). It is very likely that the market's reaction to the translation information, which closely corresponds to the strength of the dollar, is averaged out between these periods of offsetting effects. I include the effect of the directional exchange rate changes of the dollar relative to the non-U.S. foreign currencies and examine the information content of the translation information under both the depreciating and the appreciating environments.

Moreover, in a survey study Rodriguez (1980) finds that managers base their decisions to hedge exchange risk exposure on weighted expected values of exchange gains and losses. Possible exchange losses carry a heavier weight than possible exchange gains in hedging decisions. It is interesting to test empirically whether investors value the translation information differently in either exchange rate environment when a translation gain versus a translation loss is disclosed.

[3] The results of the estimation of their model are discussed fully in chapter 5, which presents the research findings.

Third, another parameter that impacts MNEs' disclosed translation information is the geographic areas of MNEs' foreign operations. Soo and Soo's (1994) weak results on the translation information may also be attributable to their failure to control for the potential averaging effects resulting from an opposite direction of the value of the dollar relative to the values of foreign currencies during the period. Since the currency values of countries in the same region relative to the dollar are likely to move in the same direction, I address the issue of potentially averaging effects by partitioning the sample firms according to the geographic areas of each MNE's primary foreign operations. Moreover, the partitioning of the sample firms also addresses the issue of whether the market's response to translation information is sensitive to MNEs' geographic disclosures of their primary foreign operations.

**Purpose of the Study and Contributions**

The purpose of this research is to examine the information content of the translation information in different exchange rate environments and to examine whether the geographic segment disclosure of the MNE's primary foreign operations affects the market's reaction to the translation information. This study extends the foreign currency translation literature by (1) examining the impact of the translation information on security prices in recent years; (2) considering the impact of periods of parallel exchange rate changes among non-U.S. currencies on the translation information and on security returns; (3) investigating whether the market assigns different weights on the translation information in each exchange rate environment; and (4) incorporating the impact of the

geographic locations of MNEs' primary foreign operation on the economic valuation of MNEs.

This study contributes to the literature of currency translation by specifically including the effect of exchange rates, a risk or exposure that every MNE faces and attempts to manage, and the impact of MNEs' geographic areas of foreign operations, a factor that exposes MNEs' to exchange rate, political, and investment risks. Critics contend that the accounting requirements of both SFAS No. 8 and SFAS No. 52 fail to disclose fully the exposure to exchange risks, rendering the accounting information that describes the effects of exchange rate fluctuations almost useless to investors or corporate managers (Shapiro 1975; Ziebart 1985). As more firms choose to disclose the translation information only in stockholders' equity, the information on translation gains and losses becomes a more important source of information regarding the effects of exposure to exchange risk. Therefore, the empirical evidence of this study provides insights into whether investors use this information to evaluate the exposure of MNEs' foreign operations to exchange rate changes, reflected in the expectation of stock returns. Moreover, the examination of the geographic area of MNEs' foreign operations also provides insight into the equity market's reaction to the exposure of MNEs to exchange rate risks. Finally, this research provides evidence on whether investors view translation losses as having more influential value in the economic valuation of MNEs than the translation gain information.

Second, this study contributes to the MNE research by providing an exploratory examination of the impact of MNEs' geographical operations on their security valuation.

The magnitude and the sign of the translation information reported in stockholders' equity are subject to the impact of the exchange rate changes and the involvement of the MNE in foreign countries. The identification of geographic areas of operations is an issue difficult to be specifically controlled and examined due to the ambiguity of the current disclosure practices of MNEs' geographical segment information. This study attempts to control for this issue and to provide exploratory evidence as to the economic consequences of the impact of the geographic locations of MNEs' foreign operations.

Last, the evidence of this study is important in view of the uncertainty among regulators, policymakers, academicians, and market participants with respect to the usefulness and the impact of the accounting disclosure requirements under SFAS No. 52. Results of this study should provide the policymakers and the business community with a valuable aid in policy decisions.

## Development of Research Questions

Beaver and Wolfson (1984) indicate that the future cash flows of the subsidiaries are themselves a function of exchange rates, and when future exchange rates are not completely anticipated, part of the translation gains and losses will be unanticipated. Thus, currency translation gains and losses are one source of information regarding the effects of exposure to exchange risk, and they play an important role in the analysis and performance evaluation of MNEs' foreign operations. Fluctuations in exchange rates alter the dollar value of foreign currency-denominated fixed assets and liabilities. Therefore, changes in the dollar with respect to the foreign currency in the long run can affect the value of firms with international activities. Beaver and Wolfson also claim that

analysts should view the translation information as a component of earnings. Excluding the translation information from an analysis of earnings can provide misleading performance measures of MNEs. They assert that the usefulness and quality of earnings information may suffer when translation gains and losses are not reflected in income.

In addition, during the 1980s and 1990s, the trend of the exchange rate moved in the same direction for three or four years before changing direction (see appendix A). Schweikart and Sanborn (1991) argue that, in the case of an appreciating dollar, an increasing debit balance in the Cumulative Translation Adjustment (CTA), due to deferred translation losses, will occur without ever being reflected or disclosed in income. They indicate that the period from 1980 to 1984 and part of 1985 was evidenced by a rising dollar and, accordingly, many U.S. MNEs reported a growing CTA debit balance. During the period of 1981 to 1984, some of the largest U.S. MNEs showed an erosion of equity, and the rate of erosion of their foreign-held assets outpaced the rate of growth in net assets or equity until 1985. Moreover, Schweikart and Sanborn raise the concern of the impact of CTA on financial key ratios, such as debt to equity ratio, for evaluating the performance and strength of U.S. MNEs. In the long run, equity investors should be concerned with a permanent impairment in the value of foreign assets. Furthermore, Bartov et al. (1996) suggest that exchange rate fluctuations also have an impact on the firms' cost of capital because MNEs have substantial revenues and net assets denominated in foreign currencies; therefore, fluctuations in exchange rates may increase MNEs' systematic risk.

Beaver and Wolfson's (1984) and others' arguments mentioned above lead to the first research question: *When valuing MNEs' security prices, does the market react positively to the translation gain information in a depreciating dollar movement environment and negatively to the translation loss information in an appreciating dollar movement environment*? In other words, *is there a positive relationship between the security returns of the MNEs and the unexpected translation information*?

The second research question is motivated by Rodriguez's (1980) survey findings that managers place more weight on the expected translation losses than the expected translation gains when deciding whether to hedge an exposure to exchange risk.[4] In general, managers are more inclined to cover an exposure when exchange losses are expected than when exchange gains are expected. Managers show a strong aversion to exchange losses, and avoiding exchange losses is the primary objective of exchange risk management. Exchange gains appear to play a less important role in their decisions to hedge risks. Rodriguez's findings lead to the second research question: *Does the market place more weight on the translation information when translation losses are disclosed than when translation gains are disclosed*?

The third research question is also motivated by the Soo and Soo (1994) study. In general, the strength of the dollar in one region of the world might be different from, or opposite to, its strength in another region of the world. For instance, during the same period, the Deutsche mark may be appreciating with respect to the dollar, whereas the value of the Japanese yen may experience depreciation in value with respect to the

[4] Rodriguez's (1980) study is based on the pre-SFAS No. 52 income statement effect only.

dollar.[5] Thus, the translation losses resulting from a strong dollar with respect to one foreign currency will offset the translation gains resulting from a weak dollar with respect to another foreign currency. As a result, the level and the sign of the disclosed translation gains and losses are subject to both the strength of the foreign currency to the dollar and the involvement of an MNE's foreign operation in a specific geographic area. Thus, the market's response to an MNE's disclosed translation information is likely to be sensitive to the MNE's geographic concentration of its foreign operations.

In Soo and Soo's (1994) study, they do not consider the impact of an MNE's involvement in a specific geographic region of the world and the potential averaging effects resulting from opposite dollar movements between different foreign currencies on MNEs' reported translation information in stockholders' equity. Thus, to address this issue, I partition MNEs based on the concentration of their foreign operations. Three partitions, Asia Pacific, Europe, and North and South America, are included in this study using the geographical segment disclosure of MNEs' foreign operations.

Hence, the interest is in finding whether the partition of sample firms according to the geographic regions of MNEs' primary foreign operations, combined with the effect of the exchange rate movement, will affect the association between security prices and the information on translation gains and losses. This leads to the third research question: *Controlling for the appreciating/depreciating exchange rate environment, is the market's reaction to the translation information also geographically sensitive*?

[5] For example, as shown in appendix A, the exchange rates against the U.S. dollar between the Japanese yen and the Deutsche mark moved in opposite directions between 1983-1984, 1989-1990, 1991-1993, and 1994-1995.

**Statement No. 8 Versus Statement No. 52**

Prior to SFAS No. 52, SFAS No. 8 dictated the accounting requirements for foreign exchange translation gains and losses. SFAS No. 8 required the use of the temporal method for translating the accounts of foreign subsidiaries and immediate recognition of exchange gains and losses resulting from translation or re-measuring in dollars in net income in the period in which they occur. Under the temporal method, monetary assets are translated at the current exchange rate at the balance sheet date, and nonmonetary assets (primarily inventory and property) are translated at the historic exchange rate at the time of their acquisition. Liabilities, since they are monetary items, are translated at the exchange rate at the balance sheet date. Stockholders' equity is brought forward at the historic rate at the date of purchase of the company or the issuance of the stock. The translation information produced by the translation process is reflected in earnings. In general, the companies opposed SFAS No. 8 because reported income figures were highly vulnerable to changes in foreign exchange rates (see, e.g., Choi et al. 1978; Stanley and Block 1979). Many MNEs undertook costly hedging activities to offset potential paper gains or losses that resulted from foreign currency translation. Some prior research has found that SFAS No. 8 adversely affected many MNEs' management of foreign exchange activities (e.g., Evans et al. 1978; Wilner 1982).

SFAS No. 8 was also widely criticized as a poor representation of an MNE's economic performance. Many argue that the translation of the financial statements of foreign subsidiaries into U.S. dollars for consolidation purposes, using the temporal method, exposes an MNE to exchange rate fluctuations, which is an accounting exposure,

not necessarily an economic exposure (e.g., Dukes 1978; Shank et al. 1979; Ziebart and Kim 1987). These gains and losses are simply paper gains and losses due to exchange rate movements and are unrealized and have no direct cash flow effect until the sale or liquidation of the underlying foreign investment.

Research to date on the effect of SFAS No. 8 in security markets has been inconclusive. Jain (1980) finds that the capital structures of MNEs with more intention of taking actions to neutralize the negative effects of SFAS No. 8 on earnings are significantly different from those of domestic firms. He concludes that SFAS No. 8 has an effect on the financial structure of selected MNEs. Ziebart and Kim (1987) find a negative stock price reaction to events related to the issuance of SFAS No. 8. However, Cheng (1986) detects positive market reactions around the time of the appointment of the task force and the issuance of the exposure draft of SFAS No. 8. Other research finds that the market did not react to SFAS No. 8 (e.g., Dukes 1978; Makin 1978; Shank et al. 1979).

In response to the criticisms of SFAS No. 8, the Financial Accounting Standards Board (FASB) replaced SFAS No. 8 with SFAS No. 52 in December 1981. SFAS No. 52 introduced the concept of "functional currency" in determining the reporting of translation gains and losses. The functional currency can be either the dollar, the local currency of the subsidiary, or the currency of another country. Management of the parent company is required to choose each subsidiary's functional currency on the

basis of several factors set forth by the FASB.[6]

If management determines that the dollar is the functional currency, then the translation process of that subsidiary under SFAS No. 52 is essentially the same as under the old SFAS No. 8. The immediate recognition of translation gains and losses in net income for the current period better reflects the economic exposure of the company to exchange rate fluctuations, since the calculated translation gain or loss would generally be realized and would thus affect the parent company's earnings per share. However, if the local currency is selected as the functional currency for a specific foreign subsidiary, SFAS No. 52 requires the use of the current rate-translation method and deferral of translation gains and losses until the underlying foreign investment is liquidated or sold.[7] Gains and losses occurring from foreign currency translation using the current rate method no longer flow through the income immediately for the period. Instead, SFAS No. 52 allows that these gains and losses be reported directly in owners' equity, bypassing the income statement. Under the current rate method, all assets and liabilities are translated at the current exchange rate at the balance sheet date. Earnings are translated at the average rate for the year. Translation gains and losses are reported on

[6] In general, the following factors would suggest that the dollar is the functional currency for a foreign subsidiary: 1) regular and continuing transactions with its U.S. parent company; 2) foreign subsidiaries conducting much of their business in dollars; 3) a great deal of profit repatriation to the U.S. parent; and 4) reliance on the U.S. parent company for a large part of its normal operations.

[7] The subsidiaries are in general independent from the U.S. parent company. They conduct business mostly in the foreign currency. They usually reinvest profits in the foreign country and have limited repatriation of profits to the U.S. parent company.

the balance sheet of the U.S. parent company as a component of the stockholders' equity entitled "Cumulative Translation Adjustments" (CTA).[8]

Appendix B contains International Business Machines Corp's balance sheet on December 31, 1989, and 1990. Translation adjustments of 3,266 million and 1,698 million for 1990, and 1989, respectively, are reported in the Stockholders' Equity section.

**Literature Review on SFAS No. 8 and SFAS No. 52**

In the 1970s, researchers began to examine the economic consequences of financial accounting standards, including the issuance of SFAS No. 8. Some studies have examined the capital market reaction to accounting policy deliberations and issuance of SFAS No. 8.[9] Dukes (1978) and Shank et al. (1979) find that SFAS No. 8 appeared to have had no significant effects on the security returns of MNEs. Both Makin (1978) and Salatka (1989) find negative reactions to the issuance of SFAS No. 8.

Garlicki et al. (1987), Ziebart and Kim (1987), Kim and Ziebart (1991), and Rezaee et al. (1993) examine the capital market reaction to SFAS No. 52. Garlicki et al. (1987) do not find any significant positive reaction to the change or the perceived change in reporting requirements for foreign currency translation under SFAS No. 52 during the FASB's announcement of the adoption of SFAS 52. Ziebart and Kim (1987) and Kim and Ziebart (1991) find that in general the market reacts negatively to SFAS No. 8 and positively to the issuance of SFAS No. 52. However, Rezaee et al. (1993) find an

[8] New requirements pursuant to SFAS No. 130 require that gains and losses from the translation of a foreign subsidiary's financial statements be included as a component of other comprehensive income (FASB, 1997a).

[9] Events with possible economic consequences that have been identified include the issuance of SFAS No. 8 and the policy-setting deliberations leading to the issuance of SFAS No. 8.

absence of abnormal security returns related to events pertaining to the issuance of SFAS No. 52.

Aggarwal (1978), Choi et al. (1978), Stanley and Block (1979), Rodriguez (1980), and Conover (1988) examine management actions in response to effects of these standards on reported income. Aggarwal (1978) claims that the translated data under SFAS No. 8 fail to reflect economic reality because of differential rates of inflation and measurement problems. Both Choi et al. (1978) and Stanley and Block (1979) find that financial executives of MNEs were generally opposed to SFAS No. 8, which resulted in greater volatility in reported earnings. Rodriguez (1980) finds that managers base their decisions to hedge exchange risk exposure on weighted expected values of exchange gains and losses, where possible exchange losses carry a heavier weight than possible exchange gains. Conover (1988) examines the management reactions to the accounting standard change to SFAS No. 52. She finds that the market reacted negatively to the revised exposure draft of SFAS No. 52. Moreover, the study does not reveal any evidence regarding misconduct on the part of managers in response to the accounting standard change, as predicted by agency theory. Conover suggests that international factors such as movements in foreign exchange rates should be considered in future MNE research.

Arnold and Holder (1986), Griffin and Castanias (1987), Chen et al. (1990), and Ayres and Rodgers (1994) examine the impact of SFAS No. 52 on financial analysts' perceptions and earnings forecasts. Arnold and Holder (1986) find that some of the adverse effects of SFAS No. 8 have been lessened. Griffin and Castanias (1987), Chen et

al. (1990), and Ayres and Rodgers (1994) find that SFAS No. 52 results in an improved quality of the reported earnings.

Some studies have looked into the characteristics of firms adopting SFAS No. 52 early, as well as the market response to early adoption (Ayres 1986; Benjamin et al. 1986; Brown and Brandi 1986; Aggarwal 1991; Pourciau and Schaefer 1995). Ayres (1986) finds that voluntary early adopters' income increased as a result of the adoption and that these firms typically had less than average earnings performance in the previous period. Benjamin et al. (1986) and Aggarwal (1991) report that early adopters of SFAS No. 52 were motivated by a favorable impact on income and earnings per share. Brown and Brandi (1986) find that market participants do not always distinguish between real changes in reported income due to economic events and cosmetic income changes resulting from pure accounting standard changes. Pourciau and Schaefer (1995) find that small early-adopting firms experienced marginally significant negative abnormal stock returns associated with the income-increasing effect of the change to SFAS No. 52.

Collins and Salatka (1993) compare the quality of quarterly earnings response coefficients (ERC) for the time periods of pre- and post-SFAS No. 52 between MNEs and non-MNEs. They report that earnings quality, as measured by the size of ERC, was poorer under SFAS No. 8, but improved after the implementation of SFAS No. 52 for those firms most affected by SFAS No. 52.

Soo and Soo (1994) examine the usefulness of foreign exchange gains and losses in determining MNEs' security prices. They find that the market uses the translation information reported in stockholders' equity when the white noise model is estimated, but

fail to find evidence supporting the usefulness of the translation information when the Random Walk model is estimated.

This study argues that their failure to control for exchange rate fluctuations and the geographic concentration of MNEs' foreign operations contribute to their weak results for the usefulness of the translation information. The evidence of this study supports the claim that exchange rate fluctuations cannot be ignored, and it improves the association between the translation information and security valuation. The evidence from the examination of the geographic concentration is limited, partly due to the more aggregated level of the MNEs' geographic disclosures at the continental level rather than at the country level.

Chapter 2 presents the development of the hypotheses, and chapter 3 provides the research methodology. Chapter 4 presents the sample selection and data analysis. In chapter 5, the findings are discussed, and in chapter 6, the summary and conclusions are provided.

# CHAPTER 2

## DEVELOPMENT OF THE HYPOTHESES

### The Dollar Movement Hypotheses

There are several explanations for Soo and Soo's (1994) findings of a weak association between the translation information reported in stockholders' equity and security returns. First, the period that they selected to examine is from 1981 to 1987. This period was, in general, evidenced by a rising value of the dollar between 1981 and 1985 and a declining value between 1985 and 1987 (see appendix A for the graph of the value of the dollar vis-à-vis several world currencies from 1981 to 1997). When the sample period includes both the periods of a strong dollar and a weak dollar with respect to the foreign currency, it is likely that the market's reaction to the information on translation gains and losses is averaged out between these offsetting effect periods.

Beaver and Wolfson (1984, 28) point out that "countries with relatively high nominal interest rates tend to have weak currencies, implying exchange rate losses, whereas countries with relatively low interest rates tend to have strong currencies, implying exchange rate gains." Rodriguez (1980) reports that expected translation losses carry a heavier weight in a firm's decisions to hedge exchange risk exposure. In addition, Conover (1988, 1997) also suggests that factors relevant to the global environment, such as movements in foreign exchange rates, should be considered in the studies of economic consequences of U.S. MNEs. Hence, the potential effects of different dollar movements serve as motivation to refine this research's period of examination to different time

periods of dollar movements, namely appreciating and depreciating, and to examine the information content of the translation information in different exchange rate environments.

The examination of the relation between the information on translation gains and losses and firm prices in different periods of dollar movements avoids the averaging effect from the examination of an entire sample period that contains opposite directions of dollar movements. Moreover, the identification of different sample periods with respect to dollar movements adds to the richness of the analysis of how differently investors react to the translation information when translation losses or translation gains are reported in each exchange rate environment.

As the U.S. dollar has continued its rapid appreciation against many foreign currencies in recent years, the diminished values of foreign earnings, real assets, and investments abroad have become a real exposure for many U.S. MNEs. Many firms face possible losses in value due to such factors as exchange rate changes, foreign country inflation, and economic recessions, both in the short and long run. I include these recent years as part of this study's sample period of examination and investigate the market's reaction to the effect of the dollar's strength on the valuation of MNEs' security prices.

During the period of a real appreciating (strong) dollar, I posit that the market will value the potential foreign exchange translation losses negatively, since a decrease in the credit balance of the cumulative adjustment account or an increase in the debit balance of the cumulative adjustment account is considered the erosion of equity positions of

MNEs.[1] I have a particular interest in investigating whether the market views this potential foreign-exchange translation loss negatively in MNEs' stock returns because, during periods of a rising dollar, equity investors might be concerned with a permanent impairment in the value of foreign assets. I also posit that during the period of a real depreciating (weak) dollar, the market will value the potential foreign exchange translation gains favorably. Combining the above two predictions, this suggests a positive or at least non-negative relationship between security returns and the information on translation gains and losses. Hence, hypothesis 1a is stated as follows:

> **Hypothesis 1a**: There is a positive, or at least, a non-negative relationship between the cumulative abnormal returns (CAR) and the unexpected translation information in both the appreciating and the depreciating exchange rate environments, whether or not MNEs disclose translation gains or translation losses.

Moreover, Rodriguez (1980) reports that the managers surveyed are more inclined to cover an exposure to exchange risk when exchange losses are expected than when exchange gains are expected. One dollar of possible exchange loss carries a heavier weight in hedging decisions than one dollar of possible exchange gains. I posit that the positive or at least non-negative relationship between security returns and the translation information is more pronounced when translation losses are reported than when

[1] According to purchasing power parity at its simplest, exchange rates changes between two countries reflect differences in inflation expectations of these two countries in equilibrium. However, in the short run, there are substantial deviations from the prediction of purchasing power parity. Using purchasing power parity as a short-term predictor of exchange rates between two countries is not justifiable. Therefore, in this study, I use "real appreciating/depreciating dollar" to refer to the possible deviations of exchange rate changes to compensate for differences in expected inflation between two countries.

translation gains are reported in either exchange rate environment. Hypothesis 1b is stated as follows:

> **Hypothesis 1b**: The positive, or at least, non-negative relationship between the cumulative abnormal returns (CAR) and the unexpected translation information is stronger in the appreciating exchange rate environment, where translation losses are expected, than in the depreciating environment, where translation gains are expected, whether or not MNEs disclose translation gains or translation losses.

Following Rodriguez's (1980) findings that expected exchange losses carry a heavier weight in decision making than expected exchange gains, I also posit that during the appreciating dollar period, when exchange losses are expected, investors would react more to the reported translation information in security valuation when MNEs disclose translation losses than when they disclose translation gains. Moreover, I posit that during the depreciating dollar period, when exchange gains are expected, the market would react more to the translation information in security valuation when MNEs disclose translation losses for the period than when they report translation gains. Hypotheses 1c and 1d are stated as follows:

> **Hypothesis 1c**: During a period of an appreciating dollar, when translation losses are expected, unexpected translation information will receive a higher weight in security valuation when MNEs disclose translation losses rather than translation gains.
>
> **Hypothesis 1d**: During a period of a depreciating dollar, when translation gains are expected, unexpected translation information will receive a higher weight in security

valuation when MNEs disclose translation losses rather than translation gains.

**The Geographic Concentration Hypothesis**

Another possible explanation for Soo and Soo's (1994) weak results concerns potential drawbacks in their sample selection procedures. They include firms affected by both SFAS No. 52 and SFAS No. 8, reporting foreign exchange gains and losses in the income statement and the cumulative translation gains and losses in stockholders' equity, and with foreign operations accounting for at least 10 percent of sales or identifiable assets. However, they fail to control for their sample firms' exposure to exchange rate changes. This is a potential cause for their weak results relative to the market's response to the translation information.

Bartov and Bodnar (1994, 1756) point out that "the inclusion of firms with limited linkages to international conditions, firms with exposures of opposite signs, or firms that can react to changes in international conditions at very low cost introduces noise into the analysis, and thereby reduces the ability of these studies to identify significant exchange rate exposures."[2] Soo and Soo's (1994) sample firms include firms from different industries with foreign operations in various regions of the world. As a result, the translation information reported in the Cumulative Translation Adjustment (CTA) account of stockholders' equity could be the result of the net effects of a strong dollar and a weak dollar with respect to the value of different foreign currencies. That is, the translation gains resulting from a weak dollar with respect to one foreign currency will

[2] The studies cited in Bartov and Bodnar (1994) examine the relation between stock returns and changes in the value of the U.S. dollar.

offset the translation losses resulting from a strong dollar with respect to another foreign currency. As a result, the magnitude of the disclosed translation gains or losses is subject to the impact of two factors: the strength of the foreign currencies to the value of dollar and the involvement of an MNE's foreign operation in a specific geographic area.

I posit that the market's response to an MNE's disclosed translation information is likely to be sensitive to the MNE's geographic concentration of its foreign operations. Soo and Soo's sample selection procedures may not necessarily yield or identify firms with significant exposure to exchange rate movements, and they may have included firms with opposite exposures to exchange rate changes.[3] Their failure to address the issue of potentially averaging effects of opposite dollar strengths with respect to foreign currencies for an MNE might reduce the sensitivity of security returns to translation information in their study. Thus, the weak evidence serves as motivation to investigate further, based on more refined sample identification procedures. I examine the aforementioned issue by specifically identifying MNEs with operations concentrated in specific regions of the world.

The partition of sample firms serves the purpose of controlling for the correlations between translation gains and losses and corresponding changes in the strength of the dollar with respect to the foreign currencies. This additional identification procedure of sample firms increases the likelihood of including firms with foreign exchange exposures of a similar sign, thus reducing the problem of potentially mixing MNEs with operations

[3] Exposure to exchange rate fluctuations is not one of the criteria of their sample selection procedures.

concentrated in one region of the world with MNEs with concentrated operations in another region of the world. Hence, hypothesis 2 is stated as follows:

> **Hypothesis 2**: Controlling for the depreciating/appreciating exchange rate environment, geographic concentrations of MNEs' foreign operations significantly affect the association of unexpected translation information and the cumulative abnormal returns (CAR).

# CHAPTER 3

# RESEARCH METHODOLOGY

## The Research Model

The research design refines the model used by the Soo and Soo (1994) study regarding the equity market's reaction to the translation information reported in stockholders' equity and controls for the effects of exchange rate fluctuations and geographic areas of MNEs' primary foreign operations.[1] This research examines the time period from 1986 to 1996.

The first model presented below tests the effects of exchange rate fluctuations on the information content of the translation information. This model also provides evidence regarding whether investors assign more weight to the translation information when a translation loss rather than a translation gain is reported.

$$CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 FOSE_{it} + \alpha_3 DFOSE_{it} + \alpha_4 INTDFOSE_{it} + \alpha_5 FOIS_{it} + \alpha_6 EXFOSE_i + \alpha_7 DEXFOSE_{it} + \alpha_8 EXCH_t + \alpha_9 EXCH\%_t + \alpha_{10} EXPT_{it} + u_i + \varepsilon_{it} \quad (1)$$

The second model presented below, an expansion of model 1, provides empirical evidence on the effects of geographic concentration of MNEs' primary foreign operations

[1] The following equation is the Soo and Soo (1994) model to test the information content of the translation information: $CAR_i = \alpha_0 + \alpha_1 UE_i + \alpha_2 FOSE_i + \alpha_3 FOIS_i + \varepsilon_i$

on the information content of the translation information controlling for the effect of the exchange rate environment.

$$CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 FOSE_{it} + \alpha_3 DFOSE_{it} + \alpha_4 INTDFOSE_{it} + \alpha_5 FOIS_{it} + \alpha_6 EXFOSE_{it} + \alpha_7 DEXFOSE_{it} + \alpha_8 EXCH_t + \alpha_9 EXCH\%_t + \alpha_{10} EXPT_{it} + \alpha_{11} AP_{it} + \alpha_{12} EE_{it} + \alpha_{13} SN_{it} + \alpha_{14} INRAP_{it} + \alpha_{15} INRE_{it} + \alpha_{16} INRSN_{it} + \alpha_{17} INRAPEX_{it} + \alpha_{18} INREX_{it} + \alpha_{19} INRSNEX_{it} + \lambda_i + \omega_{it} \quad (2)$$

Where:[2]

$CAR_{it}$ = the cumulative abnormal stock returns for firm "*i*" in year "*t*" for the period (-1, 0, +1) around the earnings announcement date, where 0 is the earnings announcement date.

$UE_{it}$ = the difference between actual earnings per share observed for firm "*i*" in year "*t*" and the analysts' earnings forecast, adjusted for foreign exchange gains or losses included in income, as a proxy for adjusted unexpected earnings. This variable excludes the foreign exchange gains or losses included in income and is computed on a per share basis, scaled by the stock price at the beginning of the year.

$FOSE_{it}$ = the difference between the change in cumulative foreign translation adjustment for firm "*i*" in year "*t*" and the change in cumulative foreign translation adjustment for firm "*i*" in year "*t-1*" reported in stockholders' equity, as a proxy for unexpected foreign translation gains or losses in stockholders' equity. This variable is computed on a per share basis, scaled by the stock price at the beginning of the year. For this study, the coefficient reflects an appreciating exchange rate environment (see EXCH below) and the reporting of a gross translation loss in stockholders' equity (see DFOSE below).

[2] New variables added to the original Soo and Soo (1994) estimation equation are in bold letters.

**DFOSE$_{it}$** = 1 when the MNE reports a gross translation gain in stockholders' equity for firm "*i*" in year "*t*", and 0 when otherwise.

**INTDFOSE$_{it}$** = the interaction variable between DFOSE and FOSE observed for firm "*i*" in year "*t*". For this study, the coefficient reflects an appreciating exchange rate environment (see EXCH below) and the reporting of a gross translation gain in stockholders' equity.

FOIS$_{it}$ = change in foreign exchange gain or loss from the prior year reported in the income statement for firm "*i*" in year "*t*", as a proxy for unexpected foreign exchange gains or losses included in income. This variable is computed on a per share basis, scaled by the stock price at the beginning of the year.

**EXFOSE**$_{it}$ = interaction variable between FOSE and EXCH, observed for firm "*i*" in year "*t*". For this study, the coefficient reflects a depreciating exchange rate environment (see EXCH below) and the reporting of a gross translation loss in stockholders' equity.

**DEXFOSE** = interaction variable between DFOSE and EXFOSE, observed for firm "*i*" in year "*t*". For this study, the coefficient reflects a depreciating exchange rate environment (see EXCH below) and the reporting of a gross translation gain in stockholders' equity.

**EXCH**$_t$ = 1 when the real effective U.S. exchange rate index in year "*t*" (based on relative consumer prices) is decreasing compared to that of the previous year, or, when the exchange rate of a specific foreign currency "f" in year "*t*" is decreasing compared to that of the previous year, and 0 when otherwise. A decrease in the index number reflects a depreciation. A decrease in the value of the foreign currency "f" to 1 U.S. dollar reflects a depreciation. For this study, EXCH = 1 is described as a depreciating exchange rate environment.

**EXCH%**$_t$ = change in the real effective U.S. exchange rate index in year "*t*" (based on relative consumer prices) from the prior year's index number, as a percentage of the prior year's index number, or the change in the value of the foreign currency "f" in year "*t*" to the U.S. dollar from the prior year's value, as a percentage of the prior year's currency value.

**EXPT**$_{it}$ = the export ratio of firm "*i*" in year "*t*" (a control variable). Represents an MNE's exports reported at the end of year "*t*" as a percentage of total worldwide sales. This variable controls for the economic consequence of currency fluctuations on an MNE.

**$AP_{it}$** = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in the Asian Pacific region, and 0 when otherwise.

**$EE_{it}$** = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in the European region, and 0 when otherwise.

**$SN_{it}$** = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in North and South America, and 0 when otherwise.

**$INRAP_{it}$** = interaction variable between FOSE and the geographic dummy variable AP, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

**$INRE_{it}$** = interaction variable between FOSE and the geographic dummy variable EE, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

**$INRSN_{it}$** = interaction variable between FOSE and the geographic dummy variable SN, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

**$INRAPEX_{it}$** = interaction variable between INRAP and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

**$INREX_{it}$** = interaction variable between INRE and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

**$INRSNEX_{it}$** = interaction variable between INRSN and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

$\mu_i$, $\lambda_i$ = random variables that incorporate relevant unobservable factors characterizing firm "*i*" (factors that are uncorrelated with the observable right-hand side variables).

$\varepsilon_{it}$, $\omega_{it}$ = the stochastic component for firm "*i*" in year "*t*".

"*i*" = 1, 2, …, N; N = 146 firms.

"*t*" = 1, 2, …, T; T = total number of time periods.[3]

With respect to the primary research hypothesis, the equations above are designed to assess whether exchange rate fluctuations and geographic concentration of an MNE's foreign operations have any impact on the information content of the translation information. The exchange-rate dummy variable (EXCH) is used in the equation to segregate the test period of this study into appreciating and depreciating periods. The translation gain dummy variable (DFOSE) is included to segregate the translation information into the reported translation gain component and the reported translation loss component. Three geographic dummy variables (AP, EE, and SN) are included in the equation to identify MNEs' primary foreign operations in Asia Pacific, Europe, or North and South America. MNEs that do not have more than 50 percent of the assets in any of the three geographic regions above are classified as the base group.[4]

Model 1 is estimated to test hypotheses 1a, 1b, 1c, and 1d. Appendix C-1 provides a summary of these four hypotheses. As an initial examination of whether either exchange rate environment or the reporting of either translation gains or translation losses, or both, have an impact on the association between the translation information and the cumulative abnormal returns (CAR), one tests jointly whether $\alpha_4 = \alpha_6 = \alpha_7 = 0$. The rejection of this hypothesis implies the importance of at least one of these two conditions. Further testing is needed to determine which condition should be included in the model to

[3] Note that the size of "T" is not the same for each firm.
[4] Combining both models 1 and 2, the framework of model 1 represents the "restricted model"; that is, it assumes (or restricts) the behavior of the dependent variable to be the same for all geographic regions. It tests the market's reaction to the translation information when no geographic concentration of foreign operations is identified with the SFAS No. 14 disclosures.

explain CAR or whether both conditions should be included. Additional joint testing of whether $\alpha_4 = \alpha_7 = 0$ and $\alpha_6 = \alpha_7 = 0$ must be conducted. These two tests suggest whether the reporting of translation gains rather than translation losses and whether the exchange rate environment are important separately in explaining the association between CAR and FOSE. If all of these tests are rejected, this implies that the interaction variables reflecting these conditions are needed in the model.

During the period of an appreciating dollar, MNEs would, in general, report translation losses from the translation of their foreign subsidiaries' financial statements. The market would react negatively to the potential foreign exchange translation loss. In contrast, during the period of a depreciating dollar, MNEs would, in general, report translation gains from the translation of their foreign subsidiary's financial statements. The market would react positively to the potential foreign-exchange translation gain. In both the exchange rate environments, this implies a positive or at least non-negative relationship between the translation information and CAR.

Within this formulation, for the testing of hypothesis 1a, four conditions are considered. First, a positive and statistically significant value of $\alpha_2$ would support a positive relationship between CAR and FOSE in an appreciating exchange rate environment when MNEs disclose translation losses in stockholders' equity. Second, a positive and statistically significant value of the sum of the coefficients $\alpha_2$ and $\alpha_6$ would support this hypothesis in a depreciating environment when MNEs disclose translation losses in stockholders' equity. Third, a positive and statistically significant value of the sum of the coefficients $\alpha_2$ and $\alpha_4$ would support this hypothesis in an appreciating

environment when MNEs disclose translation gains in stockholders' equity. Fourth, a positive and statistically significant value of the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, and $\alpha_7$ would support this hypothesis in a depreciating environment when MNEs disclose translation gains in stockholders' equity.

Moreover, I expect the coefficient $\alpha_6$ to be negative and statistically significant and the coefficient $\alpha_2$ to be bigger than the sum of the coefficients $\alpha_2$ and $\alpha_6$ to support hypothesis 1b when MNEs disclose translation losses in stockholders' equity. I also expect the sum of the coefficients $\alpha_2$ and $\alpha_4$ to be larger than the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, and $\alpha_7$ to support hypothesis 1b when MNEs disclose translation gains in stockholders' equity. The results of the first test suggest that, when MNEs report translation losses in stockholders' equity, the market would place more weight on the translation information in an appreciating dollar environment than it would be in a depreciating exchange environment. The results of the second test suggest that, when MNEs report translation gains in stockholders' equity, the market would place more weight on the translation information in an appreciating dollar environment than it would in a depreciating exchange environment.

For the testing of hypothesis 1c, I expect the coefficient $\alpha_4$ to be negative and statistically significant and the coefficient $\alpha_2$ to be larger than the sum of the coefficients $\alpha_2$ and $\alpha_4$ to support hypothesis 1c. The coefficient $\alpha_2$ represents the market's reaction to the translation information when a loss is reported in an appreciating exchange rate environment. The sum of the coefficients $\alpha_2$ and $\alpha_4$ represents the market's reaction to the translation information when a translation gain is reported in an appreciating

exchange rate environment. The results of this test suggest that, in an appreciating dollar environment, the market assigns a heavier weight to the translation information when a translation loss rather than a translation gain is reported. I also expect that the sum of the coefficients $\alpha_2$ and $\alpha_4$ will not be equal to zero, since the translation gain information in an environment where translation loss is expected is considered good news.

For the testing of hypothesis 1d, I expect that the sum of the coefficients $\alpha_2$ and $\alpha_6$ will not be equal to zero and will be larger than the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, and $\alpha_7$ to support hypothesis 1d. The sum of the coefficients $\alpha_2$ and $\alpha_6$ represents the market's reaction to the translation information in a depreciating exchange rate environment when an MNE reports a translation loss. The sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, and $\alpha_7$ represents the market's reaction to the translation information in a depreciating exchange rate environment when a translation gain is reported. The support of this hypothesis suggests that, in a depreciating dollar environment where a gain is expected, the market will assign a heavier weight to the translation information when a translation loss rather than a translation gain is disclosed.

Model 2 is estimated to test hypothesis 2. There are no predictions on the sign of the geographic variables, except that the sum of the slope coefficients in every geographic area test has to be non-negative. Appendix C-2 provides a summary of this hypothesis. As an initial examination of whether geographic regions of MNEs' foreign operations matter in explaining CAR, one jointly tests whether $\alpha_{11} = \alpha_{12} = \alpha_{13} = \alpha_{14} = \alpha_{15} = \alpha_{16} = \alpha_{17} = \alpha_{18} = \alpha_{19} = 0$. The rejection of this restriction implies the importance of the geographic regions. Additional examination of whether either the marginal effect of

FOSE differs across geographic regions or the marginal effect of FOSE differs across geographic regions when the exchange rate environment is either appreciating or depreciating, or both, are important in explaining the association between the translation information and CAR, one jointly tests whether $\alpha_{14} = \alpha_{15} = \alpha_{16} = \alpha_{17} = \alpha_{18} = \alpha_{19} = 0$. The rejection of this restriction implies the importance of at least one of these two conditions. Further testing is needed to determine which condition to include in the model. The joint restrictions $\alpha_{14} = \alpha_{15} = \alpha_{16}$, but not necessarily zero, and $\alpha_{17} = \alpha_{18} = \alpha_{19}$, but not necessarily zero, if imposed and rejected, suggest that the area of geographic concentration is important in explaining the marginal effect of FOSE and is needed in the model. The restriction $\alpha_{17} = \alpha_{18} = \alpha_{19} = 0$, if imposed and rejected, suggests that the interaction between geographic concentration and exchange rate environment is important.

To test the significance of the geographic variables on the association of the translation information and CAR, several geographic-area-specific tests are conducted in each exchange rate environment. In an appreciating dollar environment, I expect that the sum of the coefficients $\alpha_2$ and $\alpha_{14}$, the sum of the coefficients $\alpha_2$ and $\alpha_{15}$, and the sum of the coefficients $\alpha_2$ and $\alpha_{16}$ will be positive and will not be equal to zero to support the hypothesis that the geographical concentration of MNEs' foreign operations impacts the association of CAR and the unexpected translation information when MNEs disclose translation losses in stockholders' equity.

Moreover, in an appreciating dollar environment, I expect that the sum of the coefficients $\alpha_2$, $\alpha_4$ and $\alpha_{14}$, the sum of the coefficients $\alpha_2$, $\alpha_4$ and $\alpha_{15}$, and the sum of the

coefficients $\alpha_2$, $\alpha_4$ and $\alpha_{16}$ will be positive and will not be equal to zero to support the hypothesis that the geographical concentration of MNEs' foreign operations impacts the association of CAR and the unexpected translation information when MNEs disclose translation gains in stockholders' equity.

In a depreciating dollar environment, I expect that the sum of the coefficients $\alpha_2$, $\alpha_6$, $\alpha_{14}$, and $\alpha_{17,}$ the sum of the coefficients $\alpha_2$, $\alpha_6$, $\alpha_{15}$, and $\alpha_{18,}$ and the sum of the coefficients $\alpha_2$, $\alpha_6$, $\alpha_{16}$, and $\alpha_{19}$ will be positive and will not be equal to zero to support the hypothesis that the geographical concentration of MNEs' foreign operations impacts the association of CAR and the unexpected translation information when MNEs disclose translation losses in stockholders' equity.

Moreover, in a depreciating dollar environment, I expect that the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, $\alpha_{7,}$ $\alpha_{14}$, and $\alpha_{17}$, the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, $\alpha_{7,}$ $\alpha_{15}$, and $\alpha_{18,}$ and the sum of the coefficients $\alpha_2$, $\alpha_4$, $\alpha_6$, $\alpha_{7,}$ $\alpha_{16}$, and $\alpha_{19}$ will be positive and will not be equal to zero to support the hypothesis that the geographical concentration of MNEs' foreign operations impact the association of CAR and the unexpected translation information when MNEs disclose translation gains in stockholders' equity.

An additional issue that I control for is the economic effect of currency fluctuations on MNEs with export sales to foreign countries. In general, an appreciation in the U.S. dollar makes exporting goods more expensive in terms of the foreign currency, and this may lead to a decline in foreign demand, foreign sales revenues, or both. Consequently, the exporting MNE's value would be hurt by an appreciation of the U.S. currency and vice versa for a depreciation in the U.S. dollar. Moreover, foreign

currency changes also affect the value of real assets held by the MNE. U.S. MNEs' foreign real assets producing goods that are imported into the U.S. would benefit from an appreciation of the dollar and vice versa for a depreciation of the U.S. dollar. This is one area in which currency fluctuations have a direct economic impact on U.S. MNEs, in addition to the predicted economic consequence of translation gains and losses on MNEs in the long run. Thus, the export ratio of an MNE's export sales as a percentage of its total worldwide sales is included and controlled for as a specification check for my analysis.

## The Variables

*Cumulative Abnormal Returns*--CAR. The single factor market model is commonly used to measure the market reaction to an information signal by looking at the price reaction of the securities that may be affected by the information around the date of its announcement or disclosure. If one observes an abnormal price reaction, it is concluded that the announcement or disclosure has provided important new information to market participants. In this study, the information signal is the unexpected translation information. The abnormal return equation using the single factor market model is presented as follows:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i RM_t$$

Where:

$AR_{it}$ = the abnormal return of firm "*i*" at time "*t*" during the three-day investigation period (-1, 0, +1).

$R_{it}$ = the return on the stock of firm "*i*" at time "*t*" during the three-day investigation period (-1, 0, +1).

$RM_t$ = the return on the market index at time "*t*" during the three-day investigation period (-1, 0, +1).

The parameters, $a_i$ and $ß_i$, are estimated from the market model using daily returns from the estimation period. The estimation period consists of 200 days prior to the earnings announcement date, beginning from day -210 to day –11.[5] This is to ensure that any possible reaction to the information on translation gains and losses is not accounted for in the parameter estimates. The market model used to estimate the parameter coefficients of $a_i$ and $ß_i$ is as follows:

$$R_{it} = a_i + ß_i RM_t + v_{it}$$

Where:

$R_{it} = (P_{it} - P_{it-1})/ (P_{it-1})$, security return for firm "*i*" on day "*t*".

$P_{it}$ = the price of security on firm "*i*" adjusted for dividends, splits, and new offerings on day "*t*".

[5] The estimation period follows the Soo and Soo (1994) study.

$RM_t$ = return on market index on day "*t*".

$a_i$ = intercept of the linear relationship for firm "*i*".

$ß_i$ = parameter measuring the relationship between $R_{it}$ and the independent variable, $RM_t$, for firm "*i*".

$v_{it}$ = residual term of the return on security for firm "*i*" on day "*t*".

The model applied to estimate the cumulative abnormal returns over the investigation period (-1, 0, 1) for each firm is:

$$CAR_{it} = \sum_{-1}^{1} (R_{it} - \hat{R}_{it})$$

Where:

$$\hat{R}_{it} = \text{the predicted return on day "t" for firm "i"}$$
$$= \hat{\alpha}_i + \hat{\beta}_i RM_t$$

$$R_{it} = \text{the security return for firm "i" on day "t".}$$

*Unexpected Earnings Adjusted*--UE. The surrogate chosen to represent investors' expectations of earnings is analysts' forecasts of earnings per share. The difference between reported earnings per share and analysts' forecasts adjusting for foreign exchange gain or loss included in income is the proxy for unexpected earnings adjusted. The equation used to estimate UE is as follows:

$$UE_{it} = \left[ (EPS_i - EF_i) / PRICE_{t-1} \right] - FOIS_{it}$$

Where:

$EPS_i$ = reported earnings per share for firm "*i*".

$EF_i$ = the most recent analysts' mean earnings forecast, prior to earnings announcement, for firm "*i*".

$PRICE_{t-1}$ = stock price at the beginning of the year.

*Change in Translation Gains and Losses*--FOSE. FOSE is the difference between the change in cumulative foreign translation adjustment in year "*t*" and the change in cumulative foreign translation adjustment in year "*t-1*" reported in stockholders' equity.

*Dummy Variable Indicating the Reporting of Translation Gains in Stockholders' Equity*--DFOSE. This indicator variable takes on the value of 1 if the Cumulative Translation Adjustment (CTA) account of an MNE reflects translation gains in year "t", and 0 when otherwise.

*Interaction Variable between Translation Gains and Losses and the Indicator Variable--Translation Gains*--INTDFOSE. This variable captures the market's reaction to the reporting of translation gains in an appreciating exchange rate environment.

*Change in Foreign Exchange*--FOIS. FOIS represents the change in foreign remeasurement exchange gains and losses from the prior year reported in the income statement.

*Interaction Variable between Translation Gains and Losses and the Exchange Rate Environment*--EXFOSE. This variable combines the effects of the foreign currency

translation information and the exchange rate environment on MNEs' stock prices. This variable provides evidence as to whether there is a shift in the relationship between the translation information and the cumulative abnormal returns in a depreciating exchange rate environment.

*Interaction Variable between EXFOSE and DFOSE*--DEXFOSE. This variable combines the effect of the translation information in a depreciating exchange rate environment and the reporting of translation gains in stockholders' equity. This variable provides evidence as to whether there is a shift in the relationship between the translation information and the cumulative abnormal returns in a depreciating exchange rate environment when translation gains are reported.

*Dummy Variable Indicating the Depreciating Environment*--EXCH. The indicator variable--depreciating is operationalized in one of the two ways, depending on how precise the geographic segment disclosure is. First, if the geographic disclosure of the MNEs is not specific as to more than 50 percent of its foreign operations in a specific country, the index number of the U.S. exchange rate is used. The appreciating and depreciating environments are identified according to the real effective U.S. exchange rate index, based on relative consumer prices, reported in the monthly reports of *International Financial Statistics (IFS)*, published by the International Monetary Fund (IMF). IFS defines a real effective exchange rate index as a nominal effective exchange rate index adjusted for relative movements in national price or cost indicators of the home

country and selected countries.[6] A decrease in the index reflects a depreciation. This variable takes on the value of 1 if, at the end of the year during the test period, the value of the dollar relative to the world currencies is weakening compared to that of the previous year end, and 0 otherwise. Appendix D-1 provides a summary of the movement of the U.S. exchange rate index during the period from 1987 to 1996.

Second, if the geographic segment disclosure of the MNEs is precise and specific as to more than 50 percent of its foreign operations in a specific foreign country or region, the relative strength of that foreign country's currency with respect to the U.S. dollar is used to indicate the depreciating and appreciating environments. The indicator variable takes on the value of 1 if, at the year end during the test period, the value of the dollar to that specific foreign currency is weakening compared to that of the prior year end, and 0 otherwise. Appendix D-2 summarizes the values of five major foreign currencies with respect to 1 U.S. dollar during the period from 1987 to 1996. In addition, for MNEs with Europe as the primary foreign operation location, the German mark is used as the major currency to determine the dollar appreciation versus depreciation if the MNE discloses Germany as one of its countries in Europe. If an MNE only discloses Europe as its primary location of foreign operations, the real effective U.S. exchange rate index is used as the basis of determining the EXCH variable. In addition, for MNEs with North and South America as the primary foreign operation location, the Canadian dollar is used to determine the exchange rate environment.

[6] A nominal effective exchange rate index is defined by the International Monetary Fund (IMF, 1998) as "the ratio of an index of the period average exchange rate of the currency in question to a weighted geometric average of exchange rates for the currencies of selected countries".

For instance, the 1995 geographic segment report of Exxon Corp discloses that 65 percent of its total sales and 55 percent of its total assets are from operations in Africa, Asian, Europe, the Pacific, and Australia. This geographic information is too aggregated to clearly identify the primary foreign operations. Therefore, I use the movement of the real effective U.S. exchange rate index as the basis for the EXCH dummy variable. The EXCH dummy variable takes on a value of 1, since the index number decreases from 98.47 at the end of 1994 to 95.08 at the end of 1995.

On the contrary, the 1995 geographic segment report of Aflac Inc. indicates that 85 percent of its total sales and 82 percent of its total assets are from operations in Japan. I consider the Japanese yen to be Aflac's primary foreign currency. The EXCH dummy variable takes on a value of 0 for Aflac Inc. in 1995, since the Japanese yen depreciates in value from 99.74 yen per U.S. dollar at the end of 1994, to 102.83 yen per U.S. dollar at the end of 1995.

*Percentage Change in Exchange Rate*--EXCH%. Two measures of the percentage change in exchange rates are used. The first measure represents a change in the real effective U.S. exchange rate index, based on relative consumer prices from the prior year as a percentage of the prior year's index number. This measure is applicable when the geographic disclosure of the sample firms does not provide sufficient information to determine a specific country or region for more than 50 percent of its foreign operations. The second measure of this variable is the percentage change in the foreign currency values with respect to the U.S. dollar from the prior year. This variable controls for the strength of the dollar relative to foreign currencies for year "t".

*Export Ratio*--EXPT. The control variable represents the ratio of an MNE's exports in year "t" as a percentage of total worldwide sales. This variable is included in the model to control for each MNE's exposure to exchange rate changes.

*Dummy Variable Indicating the Geographic Concentration of an MNE's Foreign Operations*--AP, EE, and SN. This variable takes on the value of 1 if more than 50 percent of an MNE's foreign assets are situated in one specific country or region of the world. Three specific regions are identified after examining the geographic segment disclosures of the sample MNEs of this study. They are Asia Pacific, Europe, and North and South America. The inclusion of the Asia Pacific Rim area is motivated by the substantial increase in private capital inflows to Asian countries since 1987. The *Economic and Social Survey of Asia and the Pacific* (1996) points out that the absolute amount of foreign direct investment during the period from 1981 to 1986 amounted to an annual average of $5.2 billion in Asian countries. The direct investment in Asia was quadrupled to $20 billion in 1990, and subsequently tripled to $59 billion in 1994. The increased expansion of U.S. MNEs to the emerging markets in the Asian Pacific Rim area, in order to become globally competitive, has created a concentrated sample of firms in a similar environment (see appendix E for a summary of foreign direct investment in Asian countries from 1990 to 1995).[7]

*Interaction Variable between Translation Gains and Losses and the Geographic Concentration of Foreign Operations*--INRAP, INRE, and INRSN. This variable

[7] Data for foreign direct investments are from *Asian Development Outlook 1997 – 1998* (Asian Development Bank 1997).

combines the effects of foreign currency translation gains and losses and the geographic region of MNEs' primary foreign operations on the valuation of MNEs' stock prices. This variable provides evidence on whether the investors jointly consider MNEs' geographic segment disclosures of their primary foreign operations and the disclosures on translation gains and losses when valuing MNEs' equity securities in an appreciating exchange rate environment.

*Interaction Variable between INRAP*, *INRE*, *and INRSN and the Exchange Rate Environment*--INRAPEX, INREX, and INRSNEX. This interaction variable provides evidence on whether investors consider both the geographic disclosure of MNEs' primary foreign operations and the disclosure on translation gains and losses in a depreciating exchange rate environment.

## The Panel Data Models

In order to investigate the information content of the translation information reported in Stockholders' Equity in each MNE unit as well as across the 11-year time period from 1986 to 1996, I choose a panel data model to estimate the empirical equation presented above. The panel data model allows the combined analysis of cross-sectional MNEs over a small number of time-series observations. The following paragraph discusses two types of panel data models--the fixed effects model and the random effects model.

*The Fixed Effects Model*

The fixed effects model is also called the "unobserved effects" model. This model emphasizes each firm's "individual" effects as simple autonomous changes in the

dependent variable, and it measures unobservable, nonmeasurable characteristics that differentiate each firm. That is, this model assumes that the differences in every MNE can be captured by the intercept term of the equation and that these differences can be represented as parametric shifts in the regression line. To achieve this, firm-specific dummy variables are used to identify each MNE unit in the study. The regression will produce a unique intercept term for each MNE, assuming constant individual differences over time. The fixed effects model is the most appropriate model in situations where the study examines a relatively large number of the cross-section units in the population, or a large sample that is representative of the population.

*The Random Effects Model*

The random effects model is also called the "error components" model. This model assumes that the unobservable, nonmeasurable differences in each MNE are randomly distributed across all multinational firms in the sample. Unlike the fixed effects model, in which the individual differences are captured in the intercept term, individual differences in the random effects model are captured in the error terms. The error structure in the random effects panel data model includes both the stochastic error term specific to each cross-sectional MNE unit and the stochastic error term resulting from the regression estimation. As a result, the error term of the random effects model is not ideal. The Ordinary Least Squares (OLS) procedure cannot be used, since it will not produce efficient parameter estimates. Thus, a Generalized Least Squares (GLS) procedure is used to estimate the random effects model due to the non-ideal error structure of this model. GLS procedure will compensate for the problems of omitted

variables that are captured in the firm-specific error term "$u_i$" to correct model specification problems. The error term, "$u_i$", is a collection of unobservable/nonmeasurable factors (which are not contained in any of the independent variables of this model) that are specific to each MNE unit in the sample. The random effects model is the most appropriate for cases in which the sample of a study does not contain a large fraction of the whole population.

I choose the random effects model for the following three reasons. First, the sample contains a relatively small fraction of the MNE population existing in the Compustat database due to the sample selection constraints of this study.[8] Second, appendix E shows that the coefficients of the individual effects from the fixed effects model are mostly insignificant, indicating the inappropriateness of this component in the model. Only 8 out of the 146 firms included in this research show a significant intercept term. This suggests that cross-sectional variation in this study is not best represented by simple parametric shifts of the dependent variable, and, therefore, that the fixed effects model is inappropriate to describe the data of this research. Third, the standard Hausman test can be used to determine which panel data model, fixed effects or random effects, is more appropriate to describe the data. The null hypothesis of the Hausman test is that the fixed effects model is more appropriate, and the alternative hypothesis is that the random effects model is more appropriate. A test statistics of 51.82 clearly rejects the null hypothesis and favors the choice of the random effects model to describe the data of this

[8] Chapter 4 of this study provides a summary of the sample selection constraints imposed on the sample firms.

research. Therefore, the random effects panel data model is most appropriate and is adopted to estimate the empirical model.

# CHAPTER 4

## SAMPLE SELECTION AND ANALYSIS OF DATA

### Sample Selection Procedures

A sample of firms was initially obtained by screening the Compustat database with the following five screening criteria. First, firms must report translation gains and losses in their stockholders' equity during the period of examination.[1] Second, firms are listed on the NYSE, AMEX, or NASDAQ stock exchanges.[2] Third, at least 10 percent of an MNE's sales or identifiable assets are from foreign operations.[3] Fourth, firms must have a fiscal year ending December 31.[4] This procedure is to insure that MNEs included are all subject to the same foreign financial statement translation date and at the same exchange rate. Fifth, firms survived the entire 11 years of the test period from 1986 to 1996.[5] This procedure is to ensure that firms included in the final sample continue in the same form and have observations through time and the exchange rate environment to examine the information content of the translation information. The above five screening procedures resulted in the identification of a total of 185 firms. Moreover, the following additional screening constraints are imposed on these 185 firms:

1) Firms must be U.S. MNEs.

[1] This screening procedure yields 2,440 firms.
[2] This screening procedure reduces the sample firms to 1,758 firms.
[3] This procedure further reduces the sample size to 1,417 firms.
[4] This constraint reduces the sample size to 509 firms.
[5] 1986 is the base year to calculate the change in FOSE and FOIS for 1987.

2) The earnings announcement date is available in Compustat or the *Wall Street Journal Index*.

3) Earnings forecasts are available on the *Institutional Brokers Estimate System* (I/B/E/S) *History Tape*.

4) Stock market information is available on the *Center for Research on Security Prices (CRSP)*.

5) The submission date for the annual report or 10K is available from either Compustat PC Plus or Lexis/Nexis database.

6) Firms must report segmental geographical data as required by SFAS No. 14, *Financial Reporting for Segments of a Business Enterprise*, on their financial statements. This procedure is to insure that I can identify as closely as possible the firms with major foreign operations in a specific country or region. Furthermore, this procedure is to insure that MNEs subject to the similar foreign exchange risk exposure can be identified. Lastly, this procedure will also insure that information on export sales to foreign countries is available in the MNEs' annual reports or SEC filings.

7) Only firms that have complete data on all required items are retained in the sample.

The above seven screening restrictions reduced the sample to 146 firms with a total of 1,165 firm-year observations.[6] Appendix F provides a list of the names of the

[6] Out of the 185 firms, 15 firms are not U.S. MNEs, and 24 firms are not on IBES, CRSP, and have no earnings announcement, annual report, or 10-K dates.

146 companies included in the sample. Appendix G provides a summary of the distribution of observation by years.

**Data Sources**

The I/B/E/S *History Tape* is used to acquire information on the analysts' earnings per share (EPS) forecasts. Actual EPS are obtained from Compustat PC Plus or other sources. Earnings announcement dates are obtained from the Compustat tape or the *Wall Street Journal Index*. The information on translation gains and losses is obtained from Compustat PC Plus, Annual Reports, and 10Ks filed with the SEC. The information on export sales is obtained from Compustat PC Plus, Annual Reports, and 10Ks. The annual report (AR) or 10K release dates are defined as the submission dates to the SEC. Stock returns are obtained from the *Center for Research on Security Prices (CRSP)*. The real effective U.S. exchange rate index, based on relative consumer prices, and the exchange rates of foreign currencies to the U.S. dollar are collected for the 12-year period 1986 through 1996, inclusive, to determine the appreciating and depreciating environment. The exchange rate data are collected from the monthly reports of *International Financial Statistics*.

The ability to identify U.S. MNEs with operations primarily in a specific geographic area is crucial to the testing of hypothesis 2. The *Compustat Business Information File* identifies firms' geographic segment disclosures in codes. For example, the codes used to identify firms with Asian/Pacific Rim and European foreign operations are in the 20s and 30s, respectively. Individual firms' annual reports (ARs) or 10Ks are examined to identify firms with geographic segments in this region of the world if the

identification codes in Compustat are not clear or are not refined enough to identify the firms.

## Sample Period

The sample period of this study is from 1986 to 1996. The issue of data availability in Compustat PC Plus primarily determined the choice of 1986 as the first year of examination. Actual observations from 1986 are used to calculate the change in translation information reported in the stockholders' equity and the foreign exchange gains and losses reported in the income statement for 1987. For both the dollar movement and the geographic concentration hypotheses, the time period from 1987 to 1996 is partitioned into sub-intervals based on the direction of the dollar movement, namely, the appreciating and the depreciating time periods.

## Description of the Data

*Descriptive Statistics*

Table 1 summarizes some descriptive statistics for the final sample of the 146 firms, and table 2 provides descriptive statistics of the variables included in model 1 and model 2. Panel A of table 1 shows that the mean total assets for all firms is $10,065.48 million, and the mean net income for all firms is $320.2283 million. The mean (median) change in foreign exchange gain and loss included in income is –0.62356 (0) million over the test period of 1987 to 1996. Many of the MNEs included in the study sample do not report foreign exchange gains and losses in income, which explains the median value of 0 in foreign exchange gains and losses.[7] The mean (median) change in cumulative

[7] Of 1,165 observations, 584 report 0 in foreign exchange in income.

translation gains and losses reported in stockholders' equity is –5.56461 (-0.766) million. One interesting observation of the change in foreign exchange translation gains and losses is that in years 1991 and 1992, many firms reported a translation loss when the index of the real effective U.S. exchange rate was weakening relative to foreign currencies (see appendix D-1). However, appendix D-2 shows that 7 out of the 10 currency-years in 1991 and 1992 indicates that the U.S. currency appreciates. This implies a translation loss from the translation of foreign subsidiaries' financial statements in these countries. The significance of this phenomenon is twofold. First, this explains why the median of the gross change in the cumulative translation gains and losses is negative over the entire period. Second, it suggests the importance of coding the EXCH variable at the country level if the data permit.

Panel B of table 1 separates both foreign exchange gains in income and in equity from foreign exchange losses in income and in equity, all scaled by the absolute value of net income. The average (median) of foreign currency gains in income is 3.32 (0) percent of absolute net income, while foreign currency losses in income average (median) 6.67 (3.23) percent of absolute net income. The foreign translation gains in equity average (median) 36.01 (18.87) percent of absolute net income, while foreign translation losses in equity have an average (median) of 41.44 (16.42) percent of absolute income.

Table 2 shows that the unexpected foreign currency translation gains and losses range from a negative 20.57 percent to a positive 20.37 percent, with a mean of –0.18 percent of the market value at the beginning of the year "t". Foreign currency gains and losses in income range from a negative 7.17 percent to a positive 7.19 percent of the

market value at the beginning of the year "t". The mean of this variable shows a 0.0007 percent of the market value. This is mostly due to the fact that many firms do not report foreign currency gains and losses in income over the entire period.

*Correlation Analysis*

Table 3 presents the Pearson pair-wise correlation analysis of the variables included in model 1 and model 2. An examination of the correlation matrix in table 3 shows a high correlation between INTDFOSE and DEXFOSE of 0.7674. The high correlation between these two variables is not surprising, given that these two variables represent the translation information, in particular the translation gain information, in a depreciating environment. There is a high correlation between FOSE and EXFOSE at .739. The high correlation between these two variables suggests the possibility of either FOSE or EXFOSE having a low t-statistic if one variable dominates over the other and explains most of the variation in the dependent variable. The results from the random effects panel data model show that FOSE significantly explains the variation in CAR, but EXFOSE does not. INRAP and INRAPEX and INRE and INREX are also highly correlated at .9036 and .7584, respectively. INRAPEX and INREX are calculated by multiplying INRAP and INRE with the exchange rate dummy variable (EXCH), so it not surprising that they are highly correlated. Another high correlation is between the exchange rate dummy variable (EXCH) and the percentage change in the exchange rate (EXCH%) at -0.8167. This is not surprising given that EXCH% is calculated according to the change in the index number of the U.S. dollar over the test period or the change in the value of the designated foreign currency.

# CHAPTER 5

## RESEARCH FINDINGS

This chapter first presents a review of the results of Soo and Soo's (1994) model and those of the two models of this study; second, it presents an analysis of the findings by each hypothesis. Soo and Soo estimate both the random walk and the white noise models to examine the information content of the translation information. They find that the market uses the translation information in valuing equity securities when the white noise model is adopted, but fail to find significant results when the random walk model is estimated.[1] The results from the estimation of Soo and Soo's model and the comparison with Soo and Soo's results appear in table 4. Table 4 indicates that FOSE (the difference between the change in this year's and last year's translation gains and losses) is significant at better than the 1 percent level. The findings are stronger than Soo and Soo's results. The difference in results may be attributed to different sample firms and years examined and the mis-specification of the Soo and Soo model.

The results from the random effects model for the estimation of model one are presented in table 5. Model 1 tests the dollar movement hypotheses and examines the information content of the translation information in different exchange rate environments. It also investigates the market's reaction to the translation information

[1] The unexpected translation information used in the white noise model is the change between this year's and last year's Cumulative Translation Adjustment (CTA) account. The unexpected translation information used in the random walk model is the difference between this year's change and last year's change in the CTA account.

when translation losses or when translation gains are reported by MNEs. Table 5 indicates that the unexpected earnings (UE) variable has a significant and positive coefficient (at better than the 1% level). The translation information (FOSE) has a significant and positive coefficient (at better than the 1% level). The interaction variable (INTDFOSE) of the translation information and the translation gain dummy variable has a significantly negative coefficient (at the 3% level). The foreign currency gains and losses in income (FOIS) are not statistically significant. Both the exchange rate dummy variable (EXCH) and the percentage change in the exchange rate (EXCH%) are not statistically significant; however, the interaction variable (EXFOSE) of the translation information and the depreciating environment has a significantly negative coefficient (at the 2% level). The interaction variable between EXFOSE and DFOSE—DEXFOSE--has a significantly positive coefficient (at the 7% level). The export ratio (EXPT) is negative and statistically significant at the 8 percent level.

The results from the estimation of model 2 are presented in table 6. Model 2 tests the geographic concentration hypothesis and examines whether the market's reaction to the translation information is sensitive to the geographic concentration of MNEs' primary foreign operations under the dollar appreciating and depreciating environments. The results on the key dollar movement hypothesis variables included in model 1 are not very different from the results shown in table 5, except that the significance levels of the interaction variables (INTDFOSE, EXFOSE, and DEXFOSE) are reduced. Some of the interaction variables of the geographic dummy variables with the translation information and with the exchange rate environment are significant (INRE, INREX, and INRSNEX)

at less than the 5 percent level. However, the individual significance level of each interaction variable cannot be used to test whether the market uses the geographic information when assessing the association between CAR and the translation information. Additional tests, discussed in the later section, are performed to investigate the influence of the geographic disclosure.

Preliminary tests of whether either the exchange rate environment or the reporting of either translation gains or translation losses, or both, have an impact on the association between the translation information and CAR are performed. The joint restriction $\alpha_4 = \alpha_6 = \alpha_7 = 0$ is rejected at less than the 10 percent level. This implies the importance of at least one of these two conditions. Further testing is performed to determine which condition to include in the model. The importance of the reporting of translation gains or translation losses is assessed with the joint restriction $\alpha_4 = \alpha_7 = 0$, which is rejected at the 15 percent level. This suggests that the interaction variables reflecting the reporting of translation gains or losses are needed in the model. The importance of the exchange rate environment is assessed with the joint restriction $\alpha_6 = \alpha_7 = 0$, which is rejected at the 4 percent level. This suggests that the interaction variables reflecting the exchange rate environment are needed in the model.

The preliminary test of whether the geographic regions matter in explaining CAR is performed. The joint restriction $\alpha_{11} = \alpha_{12} = \alpha_{13} = \alpha_{14} = \alpha_{15} = \alpha_{16} = \alpha_{17} = \alpha_{18} = \alpha_{19} = 0$ is rejected at better than the 1 percent level. Additional tests are performed to determine whether either the marginal effect of FOSE differs across geographic area of concentration or the marginal effect of FOSE differs across different geographic

concentration when the exchange rate environment is either appreciating or depreciating, or both conditions, are important in explaining CAR. The joint restriction $\alpha_{14} = \alpha_{15} = \alpha_{16} = \alpha_{17} = \alpha_{18} = \alpha_{19} = 0$ is rejected at better than the 1 percent level. This implies the importance of at least one of these two conditions. Further testing is performed to determine which condition to include in the model. Whether the marginal effect of FOSE differs across the geographic area of concentration is assessed with the joint restrictions $\alpha_{14} = \alpha_{15} = \alpha_{16}$, but not necessarily zero, and $\alpha_{17} = \alpha_{18} = \alpha_{19}$, but not necessarily zero, which are rejected at the 1 percent level. This suggests that there is a marginal difference across different geographic area of concentration. Finally, the importance of the exchange rate environment interacting with the geographic concentration is assessed with the joint restriction $\alpha_{17} = \alpha_{18} = \alpha_{19} = 0$, which is rejected at better than the 1 percent level. This suggests that the marginal effect of FOSE differs across geographic area of concentration when the exchange rate environment is either appreciating or depreciating.

The results of the dollar movement hypotheses (H1a, H1b, H1c and H1d) are presented first. The results of the geographic concentration hypothesis (H2) are presented next.

**The Dollar Movement Hypotheses**

The findings of this study show support for hypothesis 1a in both the appreciating and depreciating exchange environments when translation losses are reported. To support hypothesis 1a, four conditions are considered. First, the coefficient $\alpha_2$ on the unexpected translation information (FOSE) is positive and statistically significant (different from zero) at better than the 1 percent level. This suggests a positive

relationship between FOSE and CAR in a dollar-appreciating environment when MNEs disclose translation losses. Second, the sum of the coefficients $\alpha_2 + \alpha_4$ on FOSE ($\alpha_2$) and INTDFOSE ($\alpha_4$), the interaction variable between FOSE and the dummy variable DFOSE, is positive, but not statistically significant (different from zero). The sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$), the interaction variable between the depreciating dollar environment and the translation information, is positive, and the hypothesis testing whether the sum of the coefficients is equal to zero is rejected at the 7 percent level. This suggests a positive relationship between CAR and FOSE in a depreciating exchange rate environment when MNEs report translation losses. Moreover, the sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$) and DEXFOSE ($\alpha_7$), the interaction variable between DFOSE and EXFOSE, is positive, but the hypothesis testing whether the sum of the coefficients is equal to zero cannot be rejected. In summary, for hypothesis 1a, the results do find supporting evidence for a positive relationship between CAR and FOSE in both the depreciating and appreciating exchange rate environments when MNEs report translation losses. The results do not find supporting evidence for a positive relationship between CAR and FOSE in both the depreciating and appreciating exchange rate environments when MNEs report translation gains, but do find supporting evidence that the relationship is at least non-negative.

The findings of this study also support hypothesis 1b. Hypothesis 1b states that the positive relationship between CAR and the unexpected translation information is stronger in an appreciating environment than in a depreciating environment, whether

translation gains or losses are reported. The evidence supports this prediction. The coefficient on EXFOSE ($\alpha_6$) is negative and statistically significant at the 2 percent level. The sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$) is smaller than the coefficient on FOSE ($\alpha_2$), which suggests that when MNEs report translation losses, the market weighs the unexpected translation information more in an appreciating exchange rate environment, where losses are expected, than in a depreciating exchange rate environment, where gains are expected. Both the sum of the coefficients $\alpha_2 + \alpha_4$ on FOSE ($\alpha_2$) and INTDFOSE ($\alpha_4$) and the sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), and DEXFOSE ($\alpha_7$) are not different from zero. This suggests that hypothesis 1b is not supported when MNEs disclose translation gains in stockholders' equity.[2] This is consistent with Rodriguez's (1980) findings that expected exchange losses carry a heavier weight in the decisions to hedge exchange risk exposure than expected exchange gains.

The findings of this study support hypothesis 1c that, in an appreciating exchange rate environment, the market's reaction to the unexpected translation information is stronger when a translation loss is reported by the MNE rather than when a gain is reported. In an appreciating environment, translation losses are expected. The coefficient $\alpha_2$ on FOSE represents the market's reaction to the translation information in an appreciating environment when a translation loss is reported by MNEs. The sum of the coefficients $\alpha_2 + \alpha_4$ on FOSE ($\alpha_2$) and INTDFOSE ($\alpha_4$) represents the market's

[2] Since the hypothesis testing whether FOSE + INTDFOSE = 0 and FOSE + INTDFOSE + EXFOSE + DEXFOSE = 0 cannot be rejected, the value of 0 is used for these two sums.

reaction to the translation information in an appreciating exchange rate environment when a translation gain is reported. The coefficient $\alpha_4$ on INTDFOSE is negative and statistically significant at the 3 percent level; the sum of the coefficients $\alpha_2 + \alpha_4$ on FOSE ($\alpha_2$) and INTDFOSE ($\alpha_4$) is smaller than the coefficient on FOSE ($\alpha_2$).[3] This suggests that the market's reaction to the translation information in an appreciating environment when a loss is reported is stronger than when a gain is reported. Therefore, hypothesis 1c is supported.

The findings of this study provide support for hypothesis 1d as well. Hypothesis 1d states that, in a depreciating exchange rate environment, the market would weigh the translation information more heavily when a translation loss is reported than when a translation gain is reported. In a depreciating environment, the reporting of the translation gain is expected. The sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$) represents the market's reaction to the translation information in a depreciating environment when a translation loss is reported. The sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), and DEXFOSE ($\alpha_7$) represents the market's reaction to the translation information in a depreciating exchange rate environment when a translation gain is reported by MNEs. To support hypothesis 1d, two conditions have to be satisfied. First, the hypothesis testing whether the sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$) is equal to zero has to be rejected. Second, the sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$)

[3] Following the discussion in footnote #2, the sum of the coefficients on FOSE and INTDFOSE carries a value of zero.

has to be larger than the sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), and DEXFOSE ($\alpha_7$). I examine whether each of these conditions is satisfied below.

The hypothesis testing whether the sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$) is equal to zero is rejected at the 7 percent level; however, hypothesis testing fails to reject the null hypothesis that the sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), and DEXFOSE ($\alpha_7$) is equal to zero. Second, the sum of the coefficients $\alpha_2 + \alpha_6$ on FOSE ($\alpha_2$) and EXFOSE ($\alpha_6$) is larger than the sum of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), and DEXFOSE ($\alpha_7$).[4] This suggests that the market views the report of a gross translation loss as a strong negative signal in a depreciating exchange rate environment where gains are expected, but does not react to the report of a gross translation gain in a depreciating environment as good news. This is consistent with Rodriguez's (1980) findings that managers are more inclined to cover a possible exchange loss exposure than to cover a possible exchange gain exposure. This is also consistent with her findings that the weights managers assign to possible losses is larger than the weights they assign to gains, and the difference between the weights assigned to losses and to gains increases with the magnitude of the possible exchange losses. This suggests the market's nonreaction to the reporting of translation gains when gain is expected.

[4] Following the discussion in footnote #2, the sum of the coefficients on FOSE, INTDFOSE, EXFOSE, and DEXFOSE carries a value of 0.

In summary, the dollar movement hypotheses provide strong evidence that under both the appreciating and depreciating exchange rate environments, there is a positive relationship between security returns and the translation information when MNEs disclose translation losses in stockholders' equity. The findings also provide evidence for a positive or at least non-negative relationship between security returns and the translation information when MNEs disclose translation gains in stockholders' equity. The findings provide evidence that the positive relationship between security returns and the translation information is greater in appreciating than in depreciating exchange rate environment for losses, but provide no evidence of such a difference for gains. The evidence also supports that the market reacts more to the translation information when translation losses are reported than when translation gains are reported in both exchange rate environments.

**The Geographic Concentration Hypothesis**

The geographic concentration hypothesis predicts that the geographic concentration of MNEs' foreign operations significantly affects the association of the information on translation gains and losses (FOSE) and MNEs' security returns. In order to examine the impact of the geographic concentration of MNEs' foreign operations, I structure the analysis around three major geographic concentrations--Asian Pacific, Europe, and North/South America--in both the depreciating and appreciating exchange rate environments, whether MNEs report translation gains or losses. Table 6 provides a summary of the results from the estimation of model two.

Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_{14}$ on FOSE ($\alpha_2$) and INRAP ($\alpha_{14}$) has to be non-negative and different from zero to support the claim that the disclosure of Asian Pacific foreign operations affects the association between security returns and FOSE when MNEs disclose translation losses. The hypothesis testing whether the sum of these two coefficients is equal to zero is rejected at better than the 1 percent level, and the sum of the coefficients is positive.

Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_{14}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), and INRAP ($\alpha_{14}$) has to be non-negative and different from zero to support the claim that the disclosure of Asian Pacific foreign operations affects the association between security returns and FOSE when MNEs disclose translation gains. The hypothesis testing whether the sum of these three coefficients is equal to zero is rejected at the 15 percent level, and the sum of the coefficients is positive.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_6 + \alpha_{14} + \alpha_{17}$ on FOSE ($\alpha_2$), EXFOSE ($\alpha_6$), INRAP ($\alpha_{14}$), and INRAPEX ($\alpha_{17}$) has to be non-zero and non-negative to support the claim that the disclosure of Asian Pacific operations impacts the positive relationship between the translation information and security returns when MNEs disclose translation losses. The hypothesis testing whether the sum of these four coefficients is equal to zero is rejected at the 15 percent level, and the sum of the coefficients is positive.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{14} + \alpha_{17}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), DEXFOSE ($\alpha_7$), INRAP ($\alpha_{14}$), and INRAPEX ($\alpha_{17}$) has to be non-zero and non-negative to support the claim that the disclosure of Asian Pacific operations impacts the positive relationship between the translation information and security returns when MNEs disclose translation gains. The hypothesis testing whether the sum of these six coefficients is equal to zero cannot be rejected. In summary, for the Asian Pacific partition, the weight that the market assigns to the translation information is positive in both the appreciating and depreciating exchange rate environments for losses and in the appreciating exchange rate environment for gains.

Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_{15}$ on FOSE ($\alpha_2$) and INRE ($\alpha_{15}$) has to be non-negative and different from zero to support the claim that the disclosure of the European foreign operations affects the association between security returns and FOSE when MNEs disclose translation losses. The hypothesis testing whether the sum of these two coefficients is equal to zero cannot be rejected.

Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_{15}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$) and INRE ($\alpha_{15}$) has to be non-negative and different from zero to support the claim that the disclosure of the European operations affects the association between security returns and FOSE when MNEs disclose translation gains. The hypothesis testing whether the sum of these three coefficients is equal to zero cannot be rejected.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_6 + \alpha_{15} + \alpha_{18}$ on FOSE ($\alpha_2$), EXFOSE ($\alpha_6$), INRE ($\alpha_{15}$), and INREX ($\alpha_{18}$) has to be non-zero and non-negative to support the claim that the disclosure of the European operations impacts the positive relationship between the translation information and security returns when MNEs disclose translation losses. The hypothesis testing whether the sum of these four coefficients is equal to zero is rejected at the 6 percent level, and the sum of the coefficients is positive.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{15} + \alpha_{18}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), DEXFOSE ($\alpha_7$), INRE ($\alpha_{15}$), and INREX ($\alpha_{18}$) has to be non-zero and non-negative to support the claim that the disclosure of the European operations impacts the positive relationship between the translation information and security returns when MNEs disclose translation gains. The hypothesis testing whether the sum of these six coefficients is equal to zero is rejected at the 9 percent level, and the sum of the coefficients is positive. In summary, for the European partition, the weight that the market assigns to the translation information is positive in the depreciating exchange rate environment, and zero in the appreciating exchange rate environment.

The disclosures on North/South American operations appear not useful to the market in either exchange rate environment, whether MNEs disclose translation gains or losses in the association test between security returns and the translation information. Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_{16}$ on FOSE ($\alpha_2$) and INRSN ($\alpha_{16}$) has to be non-negative and different

from zero to support the claim that the disclosure of the South/North American foreign operations affects the association between security returns and FOSE when MNEs disclose translation losses. The hypothesis testing whether the sum of these two coefficients is equal to zero cannot be rejected.

Under the appreciating exchange rate environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_{16}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), and INRSN ($\alpha_{16}$) has to be non-negative and different from zero to support the claim that the disclosure of the South/North American operations affects the association between security returns and FOSE when MNEs disclose translation gains. The hypothesis testing whether the sum of these three coefficients is equal to zero cannot be rejected.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_6 + \alpha_{16} + \alpha_{19}$ on FOSE ($\alpha_2$), EXFOSE ($\alpha_6$), INRSN ($\alpha_{16}$), and INRSNEX ($\alpha_{19}$) has to be non-zero and non-negative to support the claim that the disclosure of the South/North American operations impacts the positive relationship between the translation information and security returns when MNEs disclose translation losses. The hypothesis testing whether the sum of these four coefficients is equal to zero cannot be rejected.

Under the depreciating dollar environment, the combined magnitude of the coefficients $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{16} + \alpha_{19}$ on FOSE ($\alpha_2$), INTDFOSE ($\alpha_4$), EXFOSE ($\alpha_6$), DEXFOSE ($\alpha_7$), INRSN ($\alpha_{16}$), and INRSNEX ($\alpha_{19}$) has to be non-zero and non-negative to support the claim that the disclosure of the South/North American operations impacts the positive relationship between the translation information and security returns

when MNEs disclose translation gains. The hypothesis testing whether the sum of these six coefficients is equal to zero cannot be rejected.

Overall, the findings of this study provide limited support for the geographic concentration hypothesis. One possible explanation for the weak findings is that the aggregation of some of the geographic disclosures prevents the market from impounding the geographic information.[5] Prior studies have shown the impact of a more disaggregated geographic segment information on forecast accuracy and the usefulness of segment information. Gray and Radebaugh (1984) argue that greater disaggregation of the geographic data is needed to increase the usefulness of the geographic information. Balakrishnan et al. (1990) also argue for a more detailed geographic disclosure in order to better use certain country-specific macroeconomic factors, such as foreign currency exchange rates, inflation, interest rates, and political and legal risks. Conover et al. (1994) examine the U.S. MNEs equity performance surrounding the closure of the Mexican peso foreign exchange market. They find that firms with a specific "Mexico" geographic segment disclosure experienced a significant decrease in security prices following the Mexico foreign exchange crisis. Herrmann (1996) examines the predictability of geographic information disclosed at three levels (consolidated vs. continent vs. country) on MNEs operations. He finds that, as sales and gross profit are disclosed at a more disaggregated geographic level, the accuracy of forecasts of the company operations increases.

[5] Additional specification including the interactions between INRAP, INRE, INRSN, INRAPEX, INREX, INRSNEX, and the translation gain dummy variable – DFOSE does not improve the results. The high correlation between the geographic variables is potentially the contributing factor for the weak findings.

In this research, most disclosures on the Asian Pacific, European, and North/South American operations are not country specific. For example, some firms categorized in the European region combine "Europe, Germany, Great Britain, and France" as one line item in their geographic segment disclosure. Similarly, firms categorized in the North/South American region can report "North America and South America" or "Canada, Mexico and South America" together in one line item. I argue that the contributing factor for the limited support of the geographic concentration hypothesis is the insufficient disaggregation of the SFAS No. 14 disclosure. The market cannot sort out the effect of the geographic segment disclosures on the association of security return and the foreign currency information. The attempt of this research to identify specific geographic partitions may still include firms that differ in their risks and growth opportunities. This may introduce noise to detect a significant relationship between MNEs' stock returns and their geographic segment disclosures even though these firms have foreign operations in the same continent. Greater aggregation limits the usefulness of the information on the geographic area of MNEs' primary foreign operations and the translation information when valuing MNEs' equity securities. This explains why the geographic variables are not statistically significant.

In 1997, the FASB issued SFAS No. 131, *Disclosures about Segments of an Enterprise and Related Information*, which supersedes SFAS No. 14 (FASB, 1997b). SFAS No. 131 requires management to report its operating segment information based on how management organizes its operational units internally. Ways to define its primary operating units include products or services, geographic area, legal entities, types of

customers, or a combination of factors. One argument against the new SFAS No. 131 is that, if companies organize their disaggregated segment information along lines other than geographic areas, the quality of the geographic segment disclosure may be worse than that of the disclosure under SFAS No. 14.

The control variable, export ratio, is marginally significant at the 11 percent level. The inclusion of this variable is to control for the economic consequence of currency fluctuations on MNEs with export sales to foreign countries. One possible explanation for the marginally significant results is that most companies do not disclose their export sales in their geographic segment disclosure. Another explanation for the weak evidence is that, even with the export sales disclosure, firms do not distinctly disclose the magnitude of export sales to a specific foreign country. As a result, export ratio provides too little information to be considered useful by the market.

# CHAPTER 6

## RESEARCH SUMMARY AND CONCLUSIONS

This research examines the information content of the information on translation gains and losses in two approaches. The first approach incorporates the effect of both the appreciating and depreciating exchange rate environments and tests the dollar movement hypotheses. The second approach examines the effect of the geographic segment disclosures mandated by SFAS No. 14 on the association of security returns and the information on translation gains and losses and tests the geographic concentration hypothesis.

The findings under the dollar movement hypotheses provide strong evidence that under both the appreciating and depreciating dollar movement environments, there is a strong positive relationship between security returns and the information on translation gains and losses when MNEs disclose translation losses in stockholders' equity. The findings also provide evidence for a positive or at least non-negative relationship between the security returns and the translation information in both the depreciating and appreciating exchange rate environments when MNEs disclose translation gains. The findings provide evidence that the positive relationship between security returns and the translation information is greater in appreciating than depreciating exchange rate environments for losses, but provide no evidence of such a difference for gains. The evidence also supports that the market reacts more to the translation information when translation losses are reported than when translation gains are reported in both exchange

rate environments. This is consistent with Rodriguez's (1980) findings that exchange losses are assigned a heavier weight in decision making than are exchange gains. The findings of this study strengthen Rodriguez's findings and show that investors do not react to the reported translation gain information when a gain is expected in the depreciating exchange rate environment.

The findings under the geographic concentration hypothesis provide limited evidence that the geographic concentration of MNEs' foreign operations significantly affects the association between security returns and the translation information reported in stockholders' equity. It is possible that the greater aggregation of the geographic segment disclosure at the continental level hinders the ability of the market to sort out the effect of each country's exchange rate fluctuations included in the partition on security valuation. The evidence of this study supports the suggestion in some geographic segment disclosure research that greater disaggregation of the geographic data is needed to increase its usefulness (Gray and Radebaugh 1984; Balakrishnan et al. 1990).

Overall, it can be argued that the market uses the geographic segment information when assessing the information content of the MNEs' translation information on security returns. However, the market fails to sort out the impact of MNEs' foreign involvement at the continental level, and this is mostly due to the greater aggregation of the geographic data. Additional research investigating the impact of the geographic involvement at the country level on the translation information and on security returns is warranted

Moreover, the effect of the export ratio on equity valuation is also limited. This is probably due to either the fact that many firms do not disclose their export sales to foreign countries in their geographic segment disclosure or that the market cannot differentiate the level of export sales to foreign countries at the specific country level. These two reasons explain why the information on export sales is limited to investors when making security valuation decisions.

## Limitations of the Research

As with any empirical study, the findings of this study are subject to certain limitations. First, data constraints and the focus on MNEs with foreign operations identified in a specific region of the world limit the ability to generalize the study's results. In addition, the sample selection criteria of firms listed on the NYSE, AMEX, or NASDAQ limit the generalization of the results to large firms only. Third, problems with SFAS No. 14, such as insufficient disaggregation of geographical segment information or a lack of comparability and consistency of disclosure practices of foreign operations, give rise to the sample identification problems of this study. If an MNE combines foreign operations in both Europe and Asia together in the reporting of the performance of the geographical segment, it is impossible to determine what portions of the earnings belong to the foreign operations in Asia and whether operations in Asia constitute the primary activity of the MNE. As a result, I assigned that firm to the partition with ambiguous geographic segment information for the testing of hypothesis two. This potential sample-identification problem might introduce noise into the statistical tests and prevent this study from obtaining significant results. Fourth, a great

deal of information is disclosed around the earnings announcement date. The most general criticism to studies of information content of accounting information is whether the unexpected information signal contributes to the variations in cumulative abnormal returns or other correlated information disclosed concurrently with the information signal of interest. Fifth, firms engaging in hedging activities to manage their foreign currency exposures defer the gains and losses resulting from those activities in the cumulative translation adjust account. It is possible that the market cannot fully differentiate the translation information between the translation of foreign financial statements and the exercise of financial instruments as it is released. This may prevent the findings of or skew the results of this study for or against the hypotheses. Sixth, events experienced or announcements made by sample firms prior to the earnings announcement release date might lead investors to estimate the foreign translation information before this information is disclosed in the earnings announcement. If this occurs, it will work against finding significant results with respect to the information content of the accounting information. Finally, studies of economic consequence cannot be used in isolation to formulate accounting policy. Rather, these studies can work as only one of the inputs to accounting policy formulation and decisions.

## Suggestions for Future Research

Bartov and Bodnar (1994) find a weak association between changes in the value of the dollar and contemporaneous stock returns. They explain this finding as investors' systematic mispricing errors in the estimation of the relation between fluctuations in the dollar and firm value. This suggests that adjustments in stock prices due to changes in

the U.S. dollar may take time. Since translation gains and losses reflect changes in the value of the dollar, an extension of the current research is to investigate whether lagged exchange translation information has any explanatory power for current stock returns.

An examination of the firm's financial statements reveals firms' engagement in the off-balance-sheet financial instrument activities. Firms engage in foreign exchange contracts and option contracts to manage their foreign exchange exposure. Gains or losses resulting from these activities are deferred in the cumulative translation adjustment account. As a result, the level of the cumulative translation adjustment account includes the effect of these deferred gains or losses from the hedging activities. Due to the nature of the deferred gains and losses, investors may not fully incorporate the contemporaneous translation information in the valuation of equity securities; instead, their valuation of the firm may reflect adjustments to the lagged information on translation gains and losses.

Aggarwal and Soenen (1989) argue that foreign exchange exposure results from significant and persistent deviations from purchasing power parity conditions and from inefficiency in the foreign exchange markets.[1] The deviation from the purchasing power parity conditions results in the report of the translation information in stockholders' equity. Thus, another extension of the current research is to incorporate the theories of the purchasing power parity and the International Fisher Effect and examine the information content of the translation information from that angle.

[1] Currency translation gains and losses have no economic consequences if the concept of purchasing power parity holds.

During 1997 and 1998, countries in the Asian Pacific region suffered severe economic and financial crisis. An extension of this study is to include firms with substantial operations in that region. The future study can investigate whether the translation information provides an informative signal to the market as to the risks of MNEs with operations in the Asian Pacific area as the news broke about the economic crisis in Asia Pacific.

Future studies are warranted to examine the impact of the exchange rate environment on FOIS (the foreign exchange gain and loss information reported in income). An approach similar to that in this study could be extended to test the information content of FOIS. Future studies could examine how the market reacts to firms reporting positive, negative, and zero FOIS in the income statement under both exchange rate conditions. Moreover, since the issuance of SFAS No. 52, many firms have reported the gain and loss resulting from the translation of foreign subsidiaries' financial statements in stockholders' equity instead of the income statement. It is worth investigating the underlying factors, such as structural differences, that motivate the firms to disclose exchange gains and losses in income.

# APPENDIX A

# THE U.S. DOLLAR AND FOREIGN CURRENCY (1980 – 1997)

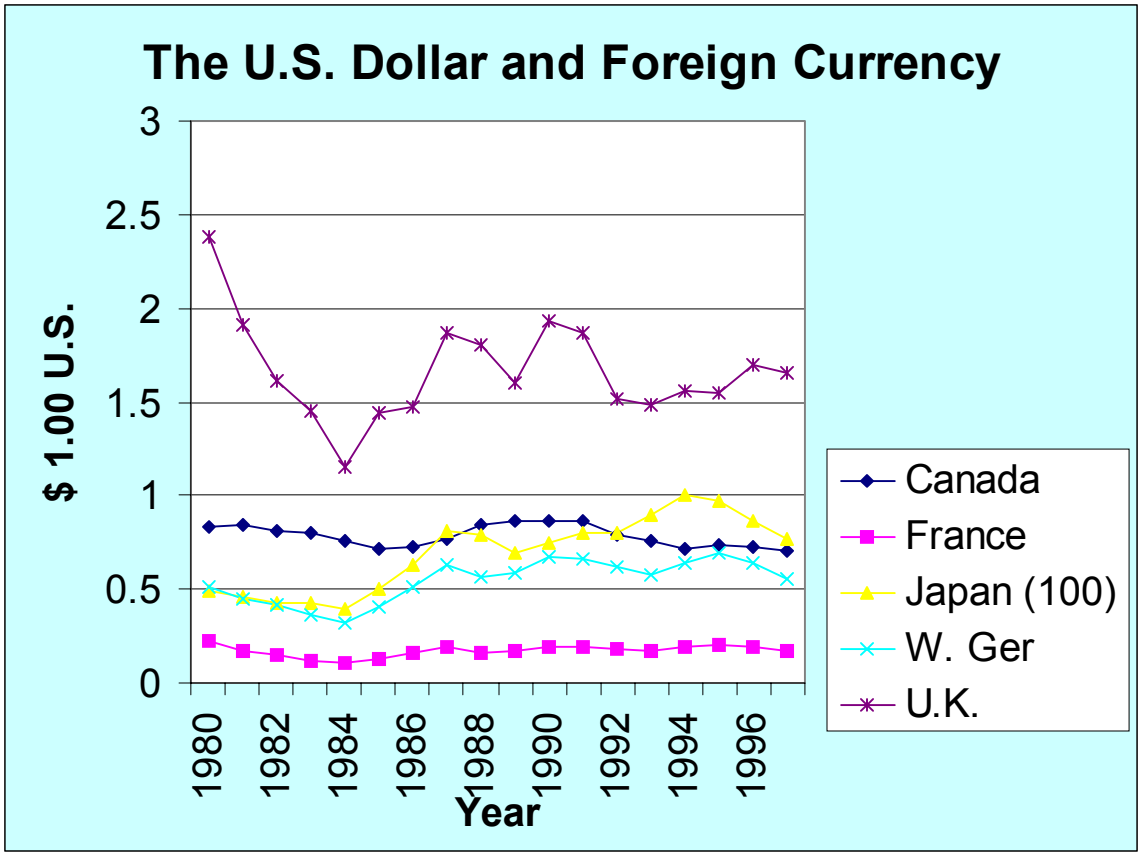


Figure 1. The U.S. dollar and foreign currency.

APPENDIX B

IBM BALANCE SHEET

IBM Balance Sheet

| At December 31: | **1990** | **1989** |
|---|---|---|
| (Dollars in million) | | |
| **ASSETS** | | |
| **Current Assets:** | | |
| Cash | $ 1,189 | $ 741 |
| Cash equivalents | 2,664 | 2,959 |
| Marketable securities, at cost, which approximates market | 698 | 1,261 |
| Notes and accounts receivable – trade, net of allowance | 20,988 | 18,866 |
| Other accounts receivable | 1,656 | 1,298 |
| Inventories | 10,108 | 9,463 |
| Prepaid expenses and other current assets | 1,617 | 1,287 |
| | 38,920 | 35,875 |
| **Plant, Rental Machines and Other Property** | 53,659 | 48,410 |
| Less: Accumulated depreciation | 26,418 | 23,467 |
| | 27,241 | 24,943 |
| **Investments and Other Assets** | | |
| Software, less accumulated amortization | 4,099 | 3,293 |
| Investments and sundry assets | 17,308 | 13,623 |
| | 21,407 | 16,916 |
| | $87,568 | $77,734 |

IBM Balance Sheet

| **LIABILITIES AND STOCKHOLDERS' EQUITY** | 1990 | 1989 |
|---|---|---|
| **Current Liabilities:** | | |
| Taxes | $ 3,159 | $ 2,699 |
| Short-term debt | 7,602 | 5,892 |
| Accounts Payable | 3,367 | 3,167 |
| Compensation and benefits | 3,014 | 2,797 |
| Deferred income | 2,506 | 1,365 |
| Other accrued expenses and liabilities | 5,628 | 5,780 |
| | 25,276 | 21,700 |
| **Long-Term Debt** | 11,943 | 10,825 |
| **Other Liabilities** | 3,656 | 3,420 |
| **Deferred Income Taxes** | 3,861 | 3,280 |
| **Stockholders' Equity** | | |
| Capital stock, par value $1.25 per share<br>Shares authorized: 750,000,000<br>Issued: 1990 - 571,618,795; 1989 – 574,775,560 | 6,357 | 6,341 |
| Retained earnings | 33,234 | 30,477 |
| **Translation adjustments** | 3,266 | 1,698 |
| | 42,857 | 38,516 |
| Less: Treasury stock, at cost (Shares: 1990 – 227,604; 1989 – 75,723 | 25 | 7 |
| | 42,832 | 38,509 |
| | $87,568 | $77,734 |

Source: The Analysis and Use of Financial Statement, 2nd edition, 1997, published by John Wiley & Sons, Inc.

# APPENDIX C

# SUMMARY OF HYPOTHESES

C-1

Summary of Hypotheses 1a, 1b, 1c, and 1d

| | Appreciating | Depreciating |
|---|---|---|
| Translation Losses | $\alpha_2$ | $\alpha_2 + \alpha_6$ |
| Translation Gains | $\alpha_2 + \alpha_4$ | $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7$ |

**Hypothesis 1a**: $\alpha_2 > 0$;
$\alpha_2 + \alpha_6 > 0$;
$\alpha_2 + \alpha_4 > 0$;
$\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 > 0$

**Hypothesis 1b**: $\alpha_2 > \alpha_2 + \alpha_6 > 0$;
$\alpha_2 + \alpha_4 > \alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 > 0$

**Hypothesis 1c**: $\alpha_2 > \alpha_2 + \alpha_4 > 0$

**Hypothesis 1d**: $\alpha_2 + \alpha_6 > \alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 > 0$

C-2

Summary of Hypothesis 2

| Asian Pacific Partition | | |
|---|---|---|
| | Appreciating | Depreciating |
| Translation Losses | $\alpha_2 + \alpha_{14} > 0$ | $\alpha_2 + \alpha_6 + \alpha_{14} + \alpha_{17} > 0$ |
| Translation Gains | $\alpha_2 + \alpha_4 + \alpha_{14} > 0$ | $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{14} + \alpha_{17} > 0$ |

| European Partition | | |
|---|---|---|
| | Appreciating | Depreciating |
| Translation Losses | $\alpha_2 + \alpha_{15} > 0$ | $\alpha_2 + \alpha_6 + \alpha_{15} + \alpha_{18} > 0$ |
| Translation Gains | $\alpha_2 + \alpha_4 + \alpha_{15} > 0$ | $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{15} + \alpha_{18} > 0$ |

| South/North American Partition | | |
|---|---|---|
| | Appreciating | Depreciating |
| Translation Losses | $\alpha_2 + \alpha_{16} > 0.$ | $\alpha_2 + \alpha_6 + \alpha_{16} + \alpha_{19} > 0$ |
| Translation Gains | $\alpha_2 + \alpha_4 + \alpha_{16} > 0$ | $\alpha_2 + \alpha_4 + \alpha_6 + \alpha_7 + \alpha_{16} + \alpha_{19} > 0$ |

APPENDIX D

EXCHANGE RATE MOVEMENT (1986 – 1996)

D-1

Exchange Rate Environment (1986-1996)

| Year | REC | Depreciating (D)<br>Appreciating (A) |
|---|---|---|
| 1986 | 119.01 | |
| 1987 | 107.24 | D |
| 1988 | 100.81 | D |
| 1989 | 104.31 | A |
| 1990 | 100 | D |
| 1991 | 98.84 | D |
| 1992 | 96.67 | D |
| 1993 | 99.96 | A |
| 1994 | 98.47 | D |
| 1995 | 95.08 | D |
| 1996 | 99.1 | A |

REC: Real effective exchange rate index, based on relative consumer prices

D-2

Values of Foreign Currency per 1 U.S. Dollar as of December 31 from 1987 to 1997

| | Canada | France | Japan (100) | Germany | Great Britain |
|---|---|---|---|---|---|
| 1986 | 1.3805 | 6.455 | 159.1 | 1.9408 | 0.678196 |
| 1987 | 1.2998 | 5.34 | 123.5 | 1.5815 | 0.534331 |
| 1988 | 1.1927 | 6.059 | 125.85 | 1.7803 | 0.552639 |
| 1989 | 1.1578 | 5.788 | 143.45 | 1.6978 | 0.622859 |
| 1990 | 1.1603 | 5.129 | 134.4 | 1.494 | 0.518672 |
| 1991 | 1.1556 | 5.18 | 1252 | 1.516 | 0.534559 |
| 1992 | 1.2711 | 5.5065 | 124.75 | 1.614 | 0.661376 |
| 1993 | 1.324 | 5.8955 | 111.85 | 1.7263 | 0.675128 |
| 1994 | 1.4028 | 5.346 | 99.74 | 1.5488 | 0.64 |
| 1995 | 1.3652 | 4.9 | 102.83 | 1.4335 | 0.64516 |
| 1996 | 1.3696 | 5.237 | 116 | 1.5548 | 0.58893 |
| 1997 | 1.4291 | 5.9881 | 129.95 | 1.7921 | 0.60467 |

# APPENDIX E

# FOREIGN DIRECT INVESTMENT

Foreign Direct Investment

($ million)

| | **1990** | **1991** | **1992** | **1993** | **1994** | **1995** |
|---|---|---|---|---|---|---|
| Newly Industrializing Economies | 9,421 | 7,868 | 6,008 | 8,188 | 9,772 | 10,372 |
| China and Mongolia | 3,487 | 4,368 | 11,156 | 27,523 | 33,797 | 37,510 |
| Southeast Asia | 6,427 | 8,078 | 9,370 | 9,904 | 8,787 | 14,415 |
| South Asia | 464 | 457 | 623 | 849 | 1,235 | 2,726 |

Source: Asian Development Outlook 1997-1998, Published for the Asian Development Bank by Oxford University Press (New York), 1997

# APPENDIX F

# FIXED EFFECT INTERCEPTS

Fixed Effect Firm-Specific Coefficient (Intercept)
and t statistics

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| ABBOTT LABORATORIES | 10 | -0.00724 | 0.01603 | -0.45165 |
| AFLAC INC | 6 | 0.00975 | 0.02074 | 0.470106 |
| AIR EXPRESS INTL | 10 | 0.03554 | 0.02107 | 1.686758 |
| ALBANY INTL CORP | 9 | 0.01333 | 0.01701 | 0.783657 |
| ALLIED RESEARCH CORP | 3 | -0.03338 | 0.03004 | -1.11119 |
| ALLIEDSIGNAL INC | 7 | 0.04875 | 0.02011 | 2.424167*** |
| ALPHARMA INC | 3 | -0.05765 | 0.02883 | -1.99965*** |
| ALUMINUM CO OF AMERICA | 10 | 0.00921 | 0.01636 | 0.562958 |
| AMERADA HESS CORP | 10 | -0.00663 | 0.01602 | -0.41386 |
| AMERICAN EXPRESS | 10 | -0.02693 | 0.01604 | -1.67893 |
| AMERICAN HOME PRDTS CORP | 10 | -0.00918 | 0.0161 | -0.57019 |
| AMP INC | 10 | -0.00555 | 0.01595 | -0.34796 |
| AON CORP | 10 | -0.00288 | 0.01613 | -0.17855 |
| ARMSTRONG WRLD INDS INC | 10 | -0.00283 | 0.01593 | -0.17765 |
| ARVIN INDUSTRIES INC | 10 | -0.00452 | 0.01617 | -0.27953 |
| ATLANTIC RICHFIELD CO | 10 | 0.00069 | 0.01607 | 0.042937 |
| AVON PRODUCTS | 10 | -0.00181 | 0.01584 | -0.11427 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| BANDAG INC | 10 | -0.01598 | 0.01604 | -0.99626 |
| BARNES GROUP INC | 10 | -0.0016 | 0.01617 | -0.09895 |
| BAUSCH & LOMB INC | 10 | 0.00828 | 0.0161 | 0.514286 |
| BAXTER INTERNATIONAL INC | 10 | 0.00078 | 0.01601 | 0.04872 |
| BEMIS CO | 9 | 0.00853 | 0.01685 | 0.506231 |
| BENEFICIAL CORP | 9 | 0.01993 | 0.01708 | 1.166862 |
| BETZDEARBORN INC | 9 | -0.00929 | 0.01687 | -0.55068 |
| BIOGEN INC | 6 | 0.01032 | 0.02052 | 0.502924 |
| BMC INDUSTRIES INC | 8 | -0.0119 | 0.01787 | -0.66592 |
| BRISTOL MYERS SQUIBB | 9 | 0.00765 | 0.01853 | 0.412844 |
| BRUNSWICK CORP | 8 | -0.01702 | 0.01788 | -0.9519 |
| CALGON CARBON CORP | 9 | -0.00282 | 0.01708 | -0.16511 |
| CATERPILLAR INC | 8 | 0.01467 | 0.01773 | 0.827411 |
| CENTOCOR INC | 9 | 0.02816 | 0.02241 | 1.256582 |
| CHAMPION INTERNATIONAL CORP | 8 | -0.00972 | 0.02538 | -0.38298 |
| CINCINNATI MILACRON INC | 9 | -0.011 | 0.01676 | -0.65632 |
| CONTINENTAL CAN | 8 | -0.00101 | 0.01874 | -0.0539 |
| COOPER INDUSTRIES INC | 4 | 0.00839 | 0.02582 | 0.324942 |
| CRANE CO | 9 | -0.01778 | 0.01703 | -1.04404 |
| CROMPTON & KNOWLES CORP | 9 | 0.0188 | 0.01677 | 1.121049 |
| CROWN CORK & SEAL CO | 8 | -0.00229 | 0.01833 | -0.12493 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| CTS CORP | 9 | -0.01046 | 0.01671 | -0.62597 |
| CUMMINS ENGINE | 3 | -0.00159 | 0.02877 | -0.05527 |
| CURTISS-WRIGHT CORP | 9 | 0.00641 | 0.01808 | 0.354535 |
| DANA CORP | 2 | -0.01038 | 0.0353 | -0.29405 |
| DATA I/O CORP | 9 | 0.00303 | 0.01712 | 0.176986 |
| DOVER CORP | 8 | -0.02292 | 0.01784 | -1.28475 |
| DOW CHEMICAL | 9 | 0.00135 | 0.01859 | 0.07262 |
| DUN & BRADSTREET CORP | 9 | -0.01931 | 0.01685 | -1.14599 |
| EATON CORP | 9 | -0.01402 | 0.0169 | -0.82959 |
| ENGELHARD CORP | 9 | 0.00861 | 0.0169 | 0.509467 |
| ETHYL CORP | 9 | -0.00976 | 0.01799 | -0.54252 |
| EXXON CORP | 9 | -0.01147 | 0.0183 | -0.62678 |
| FMC CORP | 9 | 0.00268 | 0.01682 | 0.159334 |
| FOSTER WHEELER CORP | 9 | 0.00865 | 0.01976 | 0.437753 |
| GENERAL BINDING CORP | 9 | -0.00613 | 0.01692 | -0.36229 |
| GENERAL ELECTRIC CO | 8 | 0.00028 | 0.01767 | 0.015846 |
| GENERAL MOTORS CORP | 9 | -0.00173 | 0.01767 | -0.09791 |
| GILLETTE CO | 9 | -0.00316 | 0.01692 | -0.18676 |
| GLEASON CORP | 9 | -0.00179 | 0.01669 | -0.10725 |
| GOODYEAR TIRE & RUBBER CO | 9 | 0.06859 | 0.02569 | 2.66991*** |
| GREAT LAKES CHEMICAL CORP | 9 | -0.00243 | 0.01687 | -0.14404 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| GREY ADVERTISING INC | 9 | -0.00041 | 0.01784 | -0.02298 |
| HARLEY-DAVIDSON INC | 1 | -0.0597 | 0.04949 | -1.2063 |
| HASBRO INC | 9 | 0.02933 | 0.01781 | 1.646828 |
| HERCULES INC | 9 | 0.00419 | 0.01692 | 0.247636 |
| HEXCEL CORP | 9 | -0.0093 | 0.01741 | -0.53418 |
| HOMESTAKE MINING | 7 | -0.00834 | 0.01946 | -0.42857 |
| HONEYWELL INC | 9 | -0.00042 | 0.01679 | -0.02501 |
| HOUSEHOLD INTERNATIONAL INC | 9 | 0.0261 | 0.01782 | 1.464646 |
| ILLINOIS TOOL WORKS | 9 | 0.00022 | 0.01683 | 0.013072 |
| IMO INDUSTRIES INC | 9 | 0.01172 | 0.0168 | 0.697619 |
| INGERSOLL-RAND CO | 9 | -0.03215 | 0.01717 | -1.87245 |
| INTERMET CORP | 9 | 0.02535 | 0.01846 | 1.373239 |
| INTERPUBLIC GROUP OF COS | 8 | 0.0034 | 0.01787 | 0.190263 |
| INTL BUSINESS MACHINES CORP | 9 | -0.01836 | 0.01693 | -1.08447 |
| INTL FLAVORS & FRAGRANCES | 9 | 0.00312 | 0.0169 | 0.184615 |
| IONICS INC | 9 | -0.00738 | 0.01676 | -0.44033 |
| ITT INDUSTRIES INC | 9 | 0.00506 | 0.01884 | 0.268577 |
| JOHNS MANVILLE CP | 6 | 0.00787 | 0.02052 | 0.383528 |
| JOHNSON & JOHNSON | 4 | -0.02339 | 0.02515 | -0.93002 |
| K-TRON INTERNATIONAL INC | 9 | 0.01052 | 0.01685 | 0.624332 |
| KELLOGG CO | 7 | 0.0155 | 0.01943 | 0.797735 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| KIMBERLY-CLARK CORP | 9 | -0.03011 | 0.01682 | -1.79013 |
| LAWTER INTERNATIONAL INC | 4 | -0.01117 | 0.02488 | -0.44895 |
| LILLY (ELI) & CO | 9 | -0.02059 | 0.01689 | -1.21906 |
| LINCOLN ELECTRIC CO - CL A | 9 | -0.00054 | 0.01689 | -0.03197 |
| LSI LOGIC CORP | 1 | 0.00747 | 0.05001 | 0.14937 |
| LUBRIZOL CORP | 8 | -0.01565 | 0.01793 | -0.87284 |
| MARSH & MCLENNAN COS | 9 | 0.01245 | 0.01728 | 0.720486 |
| MCDONALDS CORP | 6 | -0.0005 | 0.02044 | -0.02446 |
| MERRILL LYNCH & CO | 10 | 0.00392 | 0.01594 | 0.245922 |
| MINE SAFETY APPLIANCES CO | 10 | -0.02937 | 0.0161 | -1.82422 |
| MINNESOTA MINING & MFG CO | 4 | 0.00819 | 0.02496 | 0.328125 |
| MOBIL CORP | 9 | -0.00441 | 0.01674 | -0.26344 |
| MONSANTO CO | 9 | 0.0009 | 0.0169 | 0.053254 |
| MOORE PRODUCTS CO | 9 | -0.00743 | 0.01703 | -0.43629 |
| NATURES SUNSHINE PRODS INC | 8 | 0.00722 | 0.01771 | 0.407679 |
| NL INDUSTRIES | 4 | 0.03919 | 0.02499 | 1.568227 |
| OCCIDENTAL PETROLEUM CORP | 9 | 0.0127 | 0.01731 | 0.73368 |
| OMNICOM GROUP | 8 | 0.00766 | 0.01811 | 0.422971 |
| OWENS CORNING | 9 | 0.03002 | 0.01707 | 1.758641 |
| PACCAR INC | 9 | 0.02983 | 0.01696 | 1.758844 |
| PHARMACIA & UPJOHN INC | 3 | -0.01454 | 0.03144 | -0.46247 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| PHILIP MORRIS COS INC | 4 | 0.03058 | 0.02543 | 1.202517 |
| PHILLIPS PETROLEUM CO | 9 | -0.00013 | 0.01701 | -0.00764 |
| PITNEY BOWES INC | 9 | -0.0001 | 0.01673 | -0.00598 |
| POPE & TALBOT INC | 9 | 0.00982 | 0.01695 | 0.579351 |
| PORTA SYSTEMS CORP | 8 | -0.012 | 0.01946 | -0.61665 |
| PPG INDUSTRIES INC | 9 | -0.00282 | 0.01674 | -0.16846 |
| QUAKER CHEMICAL CORP | 8 | -0.01083 | 0.01776 | -0.6098 |
| RAYTECH CORP | 1 | 0.49331 | 0.05299 | 9.309492*** |
| REEBOK INTERNATIONAL LTD | 9 | 0.03671 | 0.01685 | 2.178635*** |
| REYNOLDS METALS CO | 9 | -0.00642 | 0.01683 | -0.38146 |
| RJR NABISCO HLDGS CORP | 5 | 0.01186 | 0.02235 | 0.530649 |
| RUBBERMAID INC | 9 | 0.00205 | 0.01689 | 0.121374 |
| RUSS BERRIE & CO INC | 9 | 0.01676 | 0.01688 | 0.992891 |
| SAFEWAY INC | 6 | 0.01499 | 0.02039 | 0.735164 |
| SEALED AIR CORP | 9 | -0.00007 | 0.01674 | -0.00418 |
| SELAS CORP OF AMERICA | 2 | -0.00492 | 0.0357 | -0.13782 |
| SEQUA CORP | 8 | 0.00209 | 0.01969 | 0.106145 |
| SIGMA-ALDRICH | 9 | 0.00927 | 0.01797 | 0.51586 |
| SONOCO PRODUCTS CO | 9 | 0.00013 | 0.01682 | 0.007729 |
| SPS TECHNOLOGIES INC | 7 | -0.00137 | 0.01935 | -0.0708 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| STANLEY WORKS | 9 | 0.00208 | 0.01684 | 0.123515 |
| STEPAN CO | 6 | -0.00596 | 0.02052 | -0.29045 |
| STONE & WEBSTER INC | 6 | -0.00022 | 0.02076 | -0.0106 |
| STRATUS COMPUTER INC | 8 | -0.05703 | 0.01786 | -3.19317*** |
| STRYKER CORP | 8 | -0.00622 | 0.0198 | -0.31414 |
| TELEFLEX INC | 9 | 0.035 | 0.01761 | 1.987507*** |
| TENNECO INC | 9 | 0.00761 | 0.01689 | 0.450562 |
| THERMO ELECTRON CORP | 9 | 0.01854 | 0.01786 | 1.038074 |
| THOMAS INDUSTRIES INC | 6 | -0.007 | 0.02078 | -0.33686 |
| TRUE NORTH COMMUNICATIONS | 3 | 0.01365 | 0.02888 | 0.472645 |
| TRW INC | 9 | 0.00877 | 0.01692 | 0.518322 |
| U S SURGICAL CORP | 9 | 0.03531 | 0.01696 | 2.081958*** |
| UNION CAMP CORP | 9 | -0.0057 | 0.0171 | -0.33333 |
| UNISYS CORP | 9 | 0.01234 | 0.01756 | 0.702733 |
| UNITED TECHNOLOGIES CORP | 9 | -0.0026 | 0.01836 | -0.14161 |
| UNOCAL CORP | 9 | -0.00508 | 0.0169 | -0.30059 |
| WARNER-LAMBERT CO | 9 | -0.01314 | 0.01684 | -0.78029 |
| WEATHERFORD ENTERRA INC | 5 | 0.01799 | 0.02259 | 0.79637 |
| WELLMAN INC | 9 | 0.01406 | 0.017 | 0.827059 |
| WEST CO INC | 9 | 0.0043 | 0.0168 | 0.255952 |

| Firm | # of years | Intercept | Std. Error | t-statistics |
|---|---|---|---|---|
| WINDMERE-DURABLE HOLDINGS | 6 | 0.01374 | 0.02053 | 0.669264 |
| WITCO CORP | 9 | 0.0007 | 0.01685 | 0.041543 |
| WYNN'S INTERNATIONAL INC | 3 | -0.00893 | 0.02887 | -0.30932 |
| XEROX CORP | 9 | 0.01494 | 0.01697 | 0.880377 |

*** significance at .05

# APPENDIX G

## DISTRIBUTION OF OBSERVATION BY YEAR

Distribution of Observation by Year
Final Sample of 146 firms

| Year | # of Observations | % |
|---|---|---|
| 1987 | 21 | 1.8 % |
| 1988 | 105 | 9.01 |
| 1989 | 120 | 10.30 |
| 1990 | 121 | 10.39 |
| 1991 | 126 | 10.82 |
| 1992 | 131 | 11.24 |
| 1993 | 137 | 11.76 |
| 1994 | 136 | 11.67 |
| 1995 | 135 | 11.59 |
| 1996 | 133 | 11.42 |
| Total | 1165 | 100.0% |

# APPENDIX H

# TABLES

Table 1

Descriptive Statistics

Panel A: Values in Millions of U.S. dollars

| | Total Assets | Net Income | Foreign Exchange Gains/Losses in Income | Foreign Exchange Gains/Losses in Equity |
|---|---|---|---|---|
| Mean | 10065.48 | 320.2283 | -0.62356 | -5.56461 |
| Median | 1912.621 | 96.0519 | 0 | -0.766 |
| Maximum | 180642.2 | 5335 | 494.6 | 1568 |
| Minimum | 38.682 | -78.0365 | -587.6 | -2251 |

Panel B: Values Scaled by Absolute Net Income

| | Foreign Exchange in Income | | Foreign Exchange in Equity | |
|---|---|---|---|---|
| | Losses | Gains | Losses | Gains |
| Mean | -0.0665 | 0.033224 | -0.41438 | 0.360101 |
| Median | -0.0323 | 0 | -0.16415 | 0.188696 |
| Maximum | -0.00034 | 0.788791 | -0.0018 | 2.499123 |
| Minimum | -0.61551 | 0 | -3.60119 | 0.000952 |
| Std. Deviation | 0.095482 | 0.109511 | 0.674859 | 0.51063 |

Table 2

Descriptive Statistics on Model Variables

| Variable | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|
| **CAR** | 0.0011 | 0.0517 | -0.2795 | 0.4769 |
| **UE** | 0.0162 | 0.1231 | -0.6086 | 2.8688 |
| **FOSE** | -0.0018 | 0.0247 | -0.2057 | 0.2037 |
| **DFOSE** | 0.4412 | 0.4967 | 0 | 1 |
| **INTDFOSE** | -0.0046 | 0.0146 | -0.2057 | 0.079 |
| **FOIS** | 0 | 0.0056 | -0.0717 | 0.0719 |
| **EXCH** | 0.5494 | 0.4978 | 0 | 1 |
| **EXCH%** | -0.0054 | 0.0727 | -0.2238 | 0.2372 |
| **EXFOSE** | -0.0023 | 0.0182 | -0.2057 | 0.2037 |
| **DEXFOSE** | -0.0026 | 0.0117 | -0.2057 | 0.079 |
| **AP** | 0.0876 | 0.2828 | 0 | 1 |
| **EE** | 0.6292 | 0.4832 | 0 | 1 |
| **SN** | 0.0884 | 0.284 | 0 | 1 |
| **INRAP** | 0 | 0.0036 | -0.0439 | 0.0309 |
| **INRE** | -0.0013 | 0.0158 | -0.179 | 0.1035 |
| **INRSN** | -0.0001 | 0.003 | -0.0446 | 0.0472 |
| **INRAPEX** | 0.0001 | 0.0032 | -0.0439 | 0.0309 |
| **INREX** | 0.0013 | 0.0117 | -0.179 | 0.1035 |
| **INRSNEX** | -0.0001 | 0.0017 | -0.0446 | 0.0082 |
| **EXPT** | 0.0441 | 0.0812 | 0 | 0.6894 |

Table 2 (continued)

Variable Definitions:

$CAR_{it}$ = the cumulative abnormal stock returns for firm "*i*" in year "*t*" for the period (-1, 0, +1) around the earnings announcement date, where 0 is the earnings announcement date.

$UE_{it}$ = the difference between actual earnings per share observed for firm "*i*" in year "*t*" and the analysts' earnings forecast, adjusted for foreign exchange gains or losses included in income, as a proxy for adjusted unexpected earnings. This variable excludes the foreign exchange gains or losses included in income and is computed on a per share basis, scaled by the stock price at the beginning of the year.

$FOSE_{it}$ = difference between the change in cumulative foreign translation adjustment for firm "*i*" in year "*t*" and the change in cumulative foreign translation adjustment for firm "*i*" in year "*t-1*" reported in stockholders' equity, as a proxy for unexpected foreign translation gains or losses in stockholders' equity. This variable is computed on a per share basis, scaled by the stock price at the beginning of the year. For this study, the coefficient reflects an appreciating exchange rate environment (see EXCH below) and the reporting of a gross translation loss in stockholders' equity (see DFOSE below).

$DFOSE_{it}$ = 1 when the MNE reports a gross translation gain in stockholders' equity for firm "*i*" in year "*t*", and 0 when otherwise.

$INTDFOSE_{it}$ = the interaction variable between DFOSE and FOSE observed for firm "*i*" in year "*t*". For this study, the coefficient reflects an appreciating exchange rate environment (see EXCH below) and the reporting of a gross translation gain in stockholders' equity.

$FOIS_{it}$ = change in foreign exchange gain or loss from the prior year reported in the income statement for firm "*i*" in year "*t*", as a proxy for unexpected foreign exchange gains or losses included in income. This variable is computed on a per share basis, scaled by the stock price at the beginning of the year.

$EXFOSE_{it}$ = interaction variable between FOSE and EXCH, observed for firm "*i*" in year "*t*". For this study, the coefficient reflects a depreciating exchange rate environment (see EXCH below) and the reporting of a gross translation loss in stockholders' equity.

DEXFOSE = interaction variable between DFOSE and EXFOSE, observed for firm "*i*" in year "*t*". For this study, the coefficient reflects a depreciating exchange rate environment (see EXCH below) and the reporting of a gross translation gain in stockholders' equity.

$EXCH_t$ = 1 when the real effective U.S. exchange rate index in year "*t*" (based on relative consumer prices) is decreasing compared to that of the previous year, or, when the exchange rate of a specific foreign currency "f" in year "*t*" is decreasing compared to that of the previous year, and 0 when otherwise. A decrease in the index number reflects a depreciation. A decrease in the value of the foreign currency "f" to 1 U.S. dollar reflects a depreciation. For this study, EXCH = 1 is described as a depreciating exchange rate environment.

$EXCH\%_t$ = change in the real effective U.S. exchange rate index in year "*t*" (based on relative consumer prices) from the prior year's index number, as a percentage of the prior year's index number, or, the change in the value of the foreign currency "f" in year "*t*" to the U.S. dollar from the prior year's value, as a percentage of the prior year's currency value.

$EXPT_{it}$ = the export ratio of firm "*i*" in year "*t*" (a control variable). Represents an MNE's exports reported at the end of year "*t*" as a percentage of total worldwide sales. This variable controls for the economic consequence of currency fluctuations on an MNE.

$AP_{it}$ = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in the Asian Pacific region, and 0 when otherwise.

$EE_{it}$ = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in the European region, and 0 when otherwise.

$SN_{it}$ = 1 when more than 50% of the foreign assets of firm "*i*" in year "*t*" are concentrated in North and South America, and 0 when otherwise.

$INRAP_{it}$ = interaction variable between FOSE and the geographic dummy variable AP, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

$INRE_{it}$ = interaction variable between FOSE and the geographic dummy variable EE, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

$INRSN_{it}$ = interaction variable between FOSE and the geographic dummy variable SN, observed for firm "*i*" in year "*t*" in an appreciating exchange rate environment.

$INRAPEX_{it}$ = interaction variable between INRAP and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

$INREX_{it}$ = interaction variable between INRE and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

$INRSNEX_{it}$ = interaction variable between INRSN and EXCH, observed for firm "*i*" in year "*t*" in a depreciating exchange rate environment.

Table 3

Pearson Correlations Coefficients on Model Variables

| | CAR | UE | FOSE | DFOSE | INTDFOSE | FOIS |
|---|---|---|---|---|---|---|
| **CAR** | 1 | | | | | |
| **UE** | 0.131 | 1 | | | | |
| **FOSE** | 0.1109 | 1.70E-02 | 1 | | | |
| **DFOSE** | -1.93E-02 | -8.94E-03 | -0.3068 | 1 | | |
| **INTDFOSE** | 1.40E-02 | -5.55E-02 | 0.6271 | -0.3499 | 1 | |
| **FOIS** | 1.60E-03 | 6.99E-02 | -2.81E-02 | -1.14E-02 | -4.11E-03 | 1 |
| **EXCH** | -7.95E-02 | -3.76E-02 | -0.1074 | 5.43E-02 | -1.80E-02 | -1.36E-02 |
| **EXCH%** | 8.43E-02 | -6.63E-04 | 0.1528 | -0.1144 | 4.62E-02 | 5.07E-02 |
| **EXFOSE** | 3.86E-02 | -1.53E-02 | 0.739 | -0.1781 | 0.4973 | -4.16E-02 |
| **DEXFOSE** | 3.12E-02 | -3.12E-02 | 0.4798 | -0.2538 | 0.7674 | -4.46E-02 |
| **AP** | -1.50E-02 | 5.49E-02 | -2.88E-03 | 2.45E-02 | 6.09E-03 | 5.24E-03 |
| **EE** | -1.98E-02 | -9.35E-03 | 7.03E-03 | -5.01E-03 | -4.90E-02 | 1.91E-02 |
| **SN** | 8.91E-02 | -2.79E-03 | -1.11E-02 | -2.10E-02 | 3.28E-02 | -2.27E-02 |
| **INRAP** | 2.09E-02 | -4.53E-03 | -7.40E-02 | 7.41E-02 | -3.90E-02 | -3.82E-02 |
| **INRE** | -0.1276 | -0.1855 | -0.414 | 0.1537 | -0.137 | 1.90E-02 |
| **INRSN** | -3.68E-02 | -1.55E-02 | -0.1012 | 0.1393 | -0.1102 | -0.1406 |
| **INRAPEX** | 2.00E-02 | 1.45E-02 | -6.63E-02 | 7.14E-02 | -2.38E-02 | -3.09E-02 |
| **INREX** | -1.60E-02 | 4.14E-02 | -0.3725 | 9.51E-02 | -0.1688 | 6.70E-02 |
| **INRSNEX** | -8.34E-02 | -6.02E-04 | -3.65E-02 | 8.79E-02 | -1.36E-02 | -6.78E-03 |
| **EXPT** | -4.58E-02 | -3.43E-02 | 1.25E-02 | 2.59E-02 | 6.16E-04 | 1.03E-03 |

Table 3 (continued)

Pearson Correlations Coefficients on Model Variables

| | CURCY | CURCYPT | EXFOSE | DEXFOSE | AP |
|---|---|---|---|---|---|
| **CURCY** | 1 | | | | |
| **CURCYPT** | -0.8167 | 1 | | | |
| **EXFOSE** | -0.1134 | 0.1463 | 1 | | |
| **DEXFOSE** | -0.2043 | 0.1933 | 0.645 | 1 | |
| **AP** | 3.64E-02 | -3.19E-02 | 5.22E-02 | 3.02E-02 | 1 |
| **EE** | -8.10E-02 | 3.35E-02 | -7.65E-02 | -7.68E-02 | -0.4035 |
| **SN** | -7.65E-02 | 6.76E-02 | 1.55E-02 | 4.92E-02 | -9.65E-02 |
| **INRAP** | 4.35E-02 | -0.1202 | -8.28E-02 | -3.53E-02 | 3.00E-02 |
| **INRE** | 0.2634 | -0.3384 | -0.3929 | -0.2086 | 2.62E-02 |
| **INRSN** | -4.10E-03 | -5.89E-02 | -2.99E-02 | -9.05E-03 | 1.12E-02 |
| **INRAPEX** | 2.69E-02 | -7.92E-02 | -8.92E-02 | -3.47E-02 | 9.57E-02 |
| **INREX** | 0.1036 | -0.198 | -0.5025 | -0.2307 | -3.55E-02 |
| **INRSNEX** | -3.58E-02 | -4.96E-03 | -5.07E-02 | -1.05E-02 | 1.22E-02 |
| **EXPT** | -1.98E-02 | 1.42E-02 | -1.84E-02 | -1.94E-02 | -0.1046 |

| | EE | SN | INRAP | INRE | INRSN | INRAPEX |
|---|---|---|---|---|---|---|
| **EE** | 1 | | | | | |
| **SN** | -0.4057 | 1 | | | | |
| **INRAP** | -1.21E-02 | -2.90E-03 | 1 | | | |
| **INRE** | -6.49E-02 | 2.63E-02 | 7.87E-04 | 1 | | |
| **INRSN** | 4.71E-02 | -0.1161 | 3.36E-04 | -3.06E-03 | 1 | |
| **INRAPEX** | -3.86E-02 | -9.23E-03 | 0.9036 | 2.51E-03 | 1.07E-03 | 1 |
| **INREX** | 8.79E-02 | -3.56E-02 | -1.07E-03 | 0.7584 | 4.14E-03 | -3.39E-03 |
| **INRSNEX** | 5.15E-02 | -0.1269 | 3.68E-04 | -3.34E-03 | 0.5536 | 1.17E-03 |
| **EXPT** | 0.1777 | -9.69E-02 | -1.37E-02 | 1.25E-02 | 1.36E-02 | -2.35E-02 |

| | INREX | INRSNEX | EXPT |
|---|---|---|---|
| **INREX** | 1 | | |
| **INRSNEX** | 4.52E-03 | 1 | |
| **EXPT** | 3.42E-02 | 2.73E-02 | 1 |

Table 4

Regression Results Coefficients and Z-statistics

Replication of the Soo and Soo's Model[1]

| Variable | Coefficient | Z=b/s.e. |
|---|---|---|
| UE | 0.061983 | 4.834**** |
| FOSE | 0.19394 | 3.246**** |
| FOIS | 0.055185 | 0.207 |
| Constant | 0.001438 | 0.40 |

Soo and Soo's Results as published[#2]

| Variable | Coefficient | Z=b/s.e. |
|---|---|---|
| UE | 0.2442 | 3.31**** |
| FOSE | 0.3527 | 1.817 |
| FOIS | 0.0707 | 1.061 |
| Constant | -0.0009 | -0.604 |

**** significance at .01 or better
*** significance at .05

# Soo and Soo (1994) published in the October issue of the *Accounting Review*.

See Table 2 for variable definitions.

[1] This study examines over the period of 1987-1996, with 1,165 observations for 146 firms.
[2] Soo and Soo (1994) examine over the period of 1981-1987 with 1474 observations for 235 firms.

Table 5

Regression Results Coefficients and Z-statistics
(Model 1)

| Variable | Coefficient | Standard Error | z=b/s.e. | Mean of X |
|---|---|---|---|---|
| UE | 5.80E-02 | 1.29E-02 | 4.508**** | 1.62E-02 |
| FOSE | 0.46262 | 0.12187 | 3.796**** | -1.78E-03 |
| DFOSE | 1.86E-03 | 3.33E-03 | 0.558 | 0.4412 |
| INTDFOSE | -0.46837 | 0.221 | -2.119*** | -4.55E-03 |
| FOIS | 7.82E-02 | 0.26754 | 0.292 | 6.55E-06 |
| EXFOSE | -0.38351 | 0.16753 | -2.289*** | -2.32E-03 |
| DEXFOSE | 0.50752 | 0.28336 | 1.791** | -2.63E-03 |
| EXCH | 1.53E-03 | 5.38E-03 | 0.284 | 0.5494 |
| EXCH% | 4.38E-02 | 3.60E-02 | 1.216 | -5.39E-03 |
| EXPT | -5.61E-02 | 3.30E-02 | -1.699** | 4.41E-02 |
| Constant | 1.02E-03 | 4.91E-03 | 0.209 | |

**** significance at .01 or better
*** significance at .05
** significance at .10
* significance at .15

See Table 2 for variable definitions.

Table 6

Regression Results Coefficients and Z-statistics
(Model 2)

| Variable | Coefficient | Standard Error | z=b/s.e. | Mean of X |
|---|---|---|---|---|
| UE | 4.37E-02 | 1.36E-02 | 3.204**** | 1.62E-02 |
| FOSE | 0.36984 | 0.12604 | 2.934**** | -1.78E-03 |
| DFOSE | 2.73E-03 | 3.33E-03 | 0.819 | 0.4412 |
| INTDFOSE | -0.35202 | 0.22388 | -1.572* | -4.55E-03 |
| FOIS | 0.10188 | 0.27018 | 0.377 | 6.55E-06 |
| EXFOSE | -0.25706 | 0.17974 | -1.43* | -2.32E-03 |
| DEXFOSE | 0.35104 | 0.28659 | 1.225 | -2.63E-03 |
| EXCH | 2.29E-03 | 5.42E-03 | 0.421 | 0.5494 |
| EXCH% | 3.47E-02 | 3.74E-02 | 0.927 | -5.39E-03 |
| EXPT | -5.22E-02 | 3.35E-02 | -1.559* | 4.41E-02 |
| AP | 4.86E-03 | 1.07E-02 | 0.455 | 8.76E-02 |
| EE | -1.36E-03 | 6.68E-03 | -0.204 | 0.6292 |
| SN | 2.21E-02 | 1.03E-02 | 2.153*** | 8.84E-02 |
| INRAP | 0.30041 | 1.0311 | 0.291 | 3.34E-05 |
| INRE | -0.57598 | 0.18532 | -3.108**** | -1.34E-03 |
| INRSN | 0.5475 | 0.6179 | 0.886 | -1.10E-04 |
| INRAPEX | 0.14117 | 1.1789 | 0.12 | 9.62E-05 |
| INREX | 0.67529 | 0.24702 | 2.734**** | 1.34E-03 |
| INRSNEX | -2.6815 | 1.1427 | -2.347**** | -6.66E-05 |
| Constant | -2.78E-03 | 7.25E-03 | -0.384 | |

**** significance at .01 or better
*** significance at .05
** significance at .10
* significance at .15

See Table 2 for variable definitions.

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when MNEs disclose translation gains. The findings provide evidence that the positive relationship is greater in appreciating than in depreciating exchange rate environment for losses, but no evidence of such a difference exists for gains. The evidence also indicates that the market reacts more to the translation information when translation losses are reported than when translation gains are reported in both exchange rate environments.

The examination of the impact of the geographic concentration of MNEs' foreign operations provides limited evidence to support the geographic concentration hypothesis. One possible explanation for the weak findings is that the larger degree of the aggregation of some of the geographic disclosures prevents the market from impounding the geographic information.